VIDE-V16435

ORDER NO. AD9304121A8

# Service Manual

Compact Disc Changer

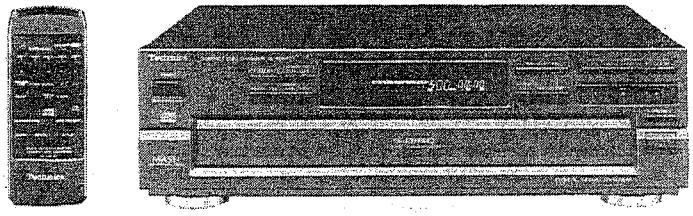
# SL-PD847

Simplified

COMPACT disc DIGITAL AUDIO

DIGITAL

MASH* multi-stage noise shaping



**Colour**

(K) ... Black Type

**Area**

| Suffix for Model No. | Area | Colour |
|---|---|---|
| (E) | Europe. | (K) |
| (GC) | Asia, Latin America, Middle Near East and Africa. | |
| (GN) | Oceania. | |

**Please file and use this manual together with the service manual for Model No. SL-PD647 (E, GC, GN), Order No. AD9304104C8.**

U00597 ※

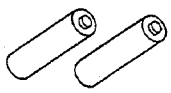
**Note:** • This simplified service manual is provided to indicate the main differences between the original model No. SL-PD647 (E) and the subsequent model No. SL-PD847 (E, GC, GN).

- Technics (or Panasonic) developed the world's first MASH type DAC and ADC. MASH technology was invented by NTT (LSI Labs).
- MASH is a trademark of NTT.

## ADDITION

### ■ ACCESSORIES (page 3 of Service Manual.)

Remote-control transmitter (RAK-SL002WH)..... 1 pc.



Batteries "AAA" (R03/UM4): These are available on sale route. for remote-control transmitter .... 2 pcs.

## CHANGES

### ■ CHANGE IN REPLACEMENT PARTS LIST (on pages 46~48, 53 of Service Manual.)

**Notes:** • Mentioned in this parts list is only those different from Model No. SL-PD647 (E). All other parts are the same as for SL-PD647 (E).
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- The "(SF)" mark denotes the standard part.

| Ref. No. | Change of Part No. | | Part Name & Description | Remarks |
|---|---|---|---|---|
| | SL-PD647 (E) | → SL-PD847 (E, GC, GN) | | |
| INTEGRATED CIRCUIT(S) | | | | |
| IC401 | UPD78043B014 | **UPD78043A013** | IC, SYSTEM CONTROL & FL DRIVE | |
| IC601 | —— | **RCDHC-278** | IC, REMOTE SENSOR | Addition |

Technics

| Ref. No. | Change of Part No. SL-PD647 (E) → SL-PD847 (E, GC, GN) | | Part Name & Description | Remarks |
|---|---|---|---|---|
| TRANSISTOR(S) | | | | |
| Q471 | —— | **UN4212TA** | TRANSISTOR | Addition |
| Q472 | UN4212TA | —— | TRANSISTOR | Deletion |
| Q473 | 2SA1309A-R | —— | TRANSISTOR | Deletion |
| DIODE(S) | | | | |
| D414 | —— | **MA4051MTA** | DIODE | Addition |
| D471 | MA165 | —— | DIODE | Deletion |
| TRANSFORMER(S) | | | | |
| PT701 | RTP1K4B012 | **RTP1K4B012** | POWER TRANSFORMER | (E, GN) ⚠ |
| | | **RTP1K4E020** | POWER TRANSFORMER | (GC) ⚠ |
| SWITCH(ES) | | | | |
| S605 | —— | **EVQ21405R** | SW, ID SCAN | Addition |
| S606 | —— | **EVQ21405R** | SW, TAPE LENGTH | Addition |
| S701 | —— | —— | —— | (E, GN) |
| | | **SSR187-1** | SW, VOLTAGE ADJ. | (GC) ⚠ Addition |
| JACK(S) | | | | |
| JK471 | —— | **RJJ33T01** | SYNCHRO EDIT | Addition |
| JK472 | RJJ33TR01 | —— | REMOTE CONTROL | Deletion |
| JK701 | SJS9236 | **SJS9236** | AC INLET | (E, GN) ⚠ |
| | | **SJSD16** | AC INLET | (GC) ⚠ |
| RESISTORS | | | | |
| R471 | —— | **ERDS2TJ100** | 1/4W 10 | Addition |
| R472 | —— | **ERDS2TJ102** | 1/4W 1K | Addition |
| R474 | —— | **ERDS2TJ561** | 1/4W 560 | Addition |
| R475 | —— | **ERDS2TJ223** | 1/4W 22K | Addition |
| R476 | ERDS2TJ272T | —— | 1/4W 2.7K | Deletion |
| R477 | ERDS2TJ562 | —— | 1/4W 5.6K | Deletion |
| R478 | ERDS2TJ103 | —— | 1/4W 10K | Deletion |
| R479 | ERDS2TJ100 | —— | 1/4W 10 | Deletion |
| CAPACITORS | | | | |
| C472, 473 | —— | **ECBT1C103NS5** | 16V 0.01U | Addition |
| C601 | ECFR1E104ZF5 | **ECFR1E103KR** | 25V 0.01U | |
| CABINET AND CHASSIS | | | | |
| 12 | RFKHLPD647EK | **RFKHLPD847EK** | REAR PANEL ASS'Y | (E) |
| | | **RFKHLPD847GC** | REAR PANEL ASS'Y | (GC) |
| | | **RFKHLPD847GN** | REAR PANEL ASS'Y | (GN) |
| 37 | RFKGLPD647EK | **RFKGLPD847EK** | FRONT PANEL ASS'Y | |
| 37-1 | RGK0470 | **RGK0470A** | FRONT ORNAMENT PLATE | |
| PACKING MATERIAL | | | | |
| P1 | RPG1495 | **RPG1496** | PACKING CASE | |
| P5 | —— | **RPQ0273** | PAD | Addition |
| ACCESSORIES | | | | |
| A1 | RQT1987-E | **RQT1987-E** | INSTRUCTION MANUAL | (E) |
| | | **RFKSLPD847GC** | INSTRUCTION MANUAL ASS'Y | (GC) |
| | | **RQT1843-L** | INSTRUCTION MANUAL | (GN) |
| A2 | RQA0013 | **RQA0013** | WARRANTY CARD | (E) |
| | | —— | —— | (GC) |
| | | **RQX7433ZA** | WARRANTY CARD | (GN) |
| A4 | RJA0019-2K | **RJA0019-2K** | AC POWER SUPPLY CORD | (E, GC) ⚠ (SF) |
| | | **SJA173** | AC POWER SUPPLY CORD | (GN) ⚠ (SF) |
| A6 | SJP2257T | —— | REMOTE CONTROL CABLE | Deletion |
| A7 | —— | —— | —— | (E, GN) |
| | | **RQLA0134** | VOLTAGE CAUTION LABEL | (GC) Addition |
| A8 | —— | —— | —— | (E, GN) |
| | | **SJP5213-2** | POWER PLUG ADAPTOR | (GC) ⚠ Addition |
| A9 | —— | **RAK-SL002WH** | REMOTE CONTROL TRANSMITTER | Addition |
| A9-1 | —— | **RKK0020-K** | BATTERY COVER FOR R/C TRANSMITTER | Addition |

# SCHEMATIC DIAGRAM

**(page 37～39 of Service Manual.)**

(This schematic diagram may be modified at any time with development of new technology.)

**Note:**

- **S551** : Up/down det. switch.
- **S552** : Open det. switch.
- **S601** : Time mode (TIME MODE) select switch.
- **S602** : Spiral (SPIRAL) switch.
- **S603** : Random (RANDOM) switch.
- **S604** : Repeat (REPEAT) switch.
- **S605** : ID scan (ID SCAN) switch.
- **S606** : Tape length (TAPE LENGTH) switch.
- **S608, 609** : Search (SEARCH) switches. [S608: ◀◀, S609: ▶▶]
- **S610～614** : Disc (DISC 1～5) switches. [S610: 1, S611: 2, S612: 3, S613: 4, S614: 5]
- **S615** : Program mode (PROGRAM MODE) switch.
- **S616, 617** : Skip (SKIP) switches. [S616: ⏮, S617: ⏭]
- **S618** : Disc skip (DISC SKIP) switch.
- **S619** : Loading drawer open/close (▲ OPEN/CLOSE) switch.
- **S620** : Stop (■ STOP) switch.
- **S621** : Pause (▮▮ PAUSE) switch.
- **S622** : Play (▶ PLAY) switch.
- **S624** : Power (POWER) switch.
- **S701** : Voltage adj. switch in "240V" position. (110V ↔ 127V ↔ 220V ↔ 240V) [For (GC) area only.]
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
  Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
- ＊The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used as occation calls. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- The supply part number is described alone in the replacement parts.

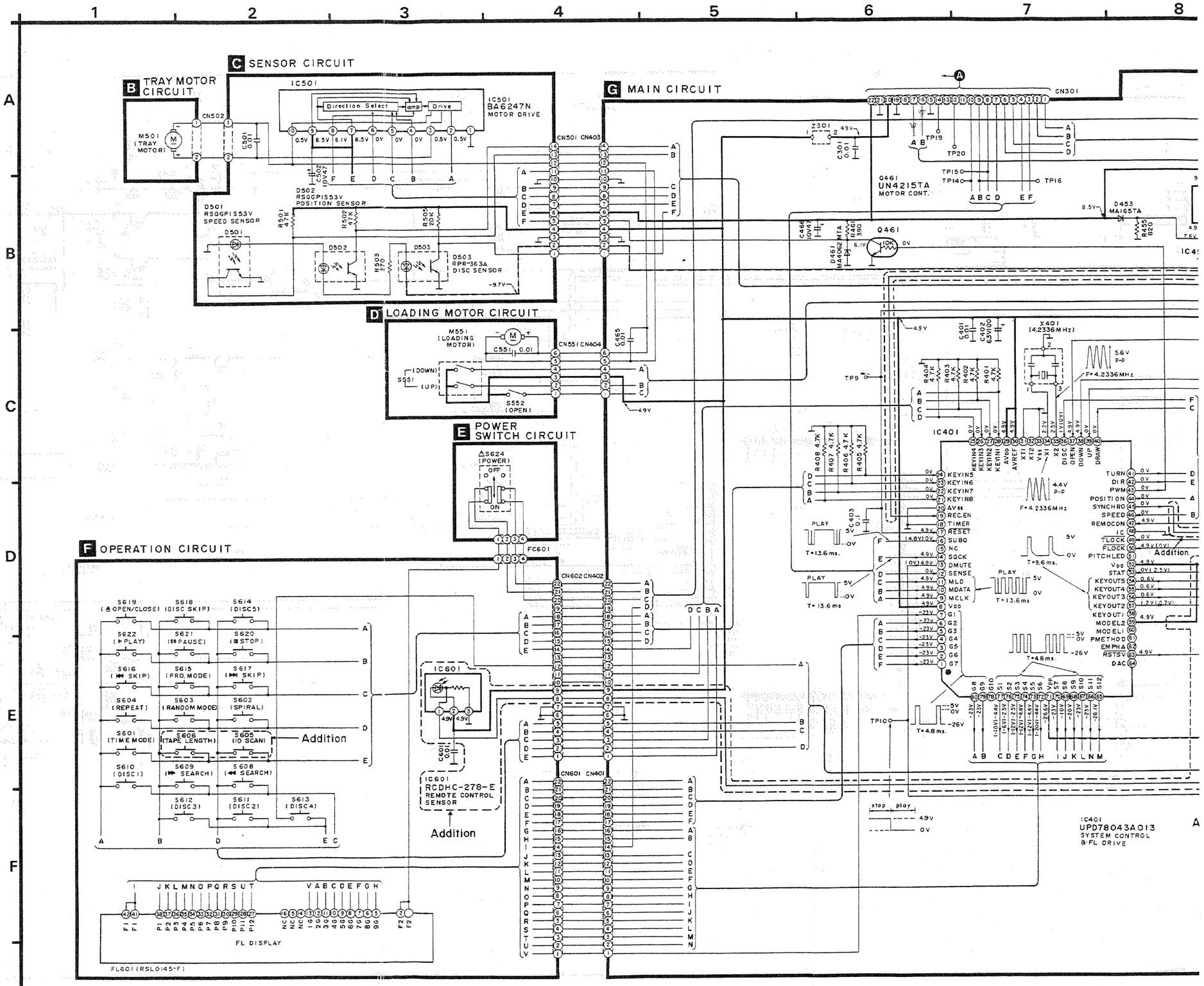
| Part No. | Production Part No. | Supply Part No. |
|---|---|---|
| IC11 | LM2940T5M | LM2940T5 |
| IC451, 801 | BA4558FT1 | SVIBA4558F |
| IC601 | RCDHC-278-E | RCDHC-278 |

- ▬▬ / ▬ ▬ ▬ : Positive voltage lines and negative voltage lines.
- ⇢⇢⇢ : Audio signal lines.

**Caution!**

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.



5 6 7 8 9 10 11 12 13 14

CIRCUIT

CN301

IC451
BA4558FTI
RESET SIGNAL GENERATOR

Q451
UN4212TA
RESET SIGNAL GENERATOR

Q31
2SB1238QSTV6
REGULATOR

D11,12,31,32
RLN4003NO2

CN701

PT701

L701

L702

JK701

AC 230 - 240V (50/60Hz)

Addition

Q461
UN4215TA
MOTOR CONT.

IC451
LM2940T5M
REGULATOR

Q15,16
2SD2037EFTA
REGULATOR

Q471
UN4212TA
SWITCHING (SYNCHRO EDIT)

JK471
SYNCHRO EDIT

IC401
UPD78043A013
SYSTEM CONTROL & FL DRIVE

Q401~403
DTC143ESTP
SWITCHING

Q21
2SC3311QRSTA
REGULATOR

Q853
UN4112TA
MUTING CONT.

Q852
UN4212TA
MUTING CONT.

Q851
UN4112TA
MUTING CONT.

Q22
2SA1309QRSTA
REGULATOR

IC801
BA4558FTI
L.P. FILTER AMP

Q801,802
2SD1450RSTTA
MUTING

JK801
L ch
R ch
OUT

H POWER SUPPLY CIRCUIT For (E,GN) areas.

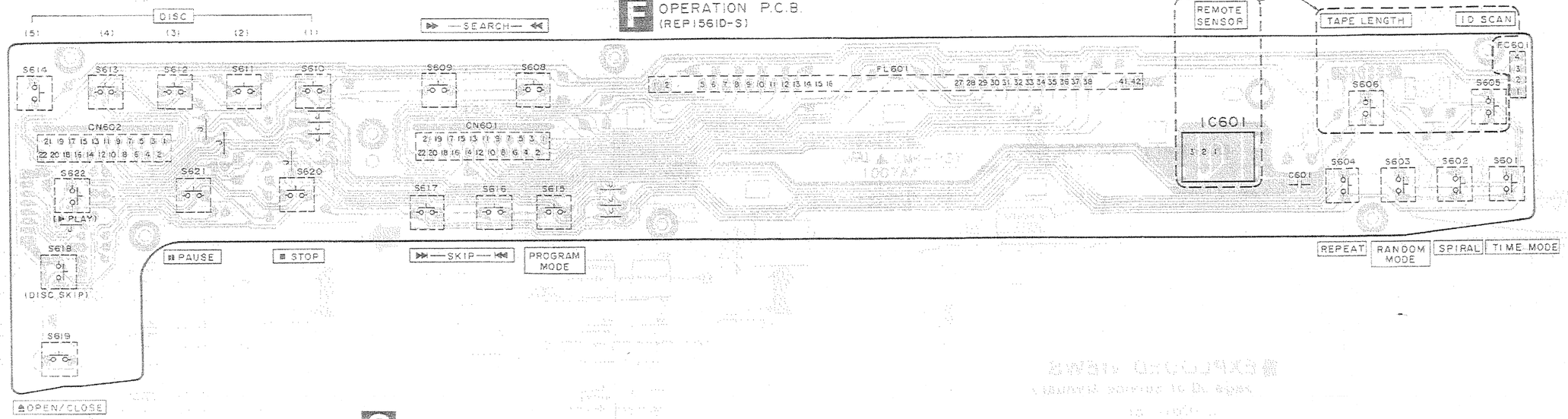
H POWER SUPPLY CIRCUIT For (GC) area.

S701 (VOLT ADJ.)
240V
220V
127V
110V

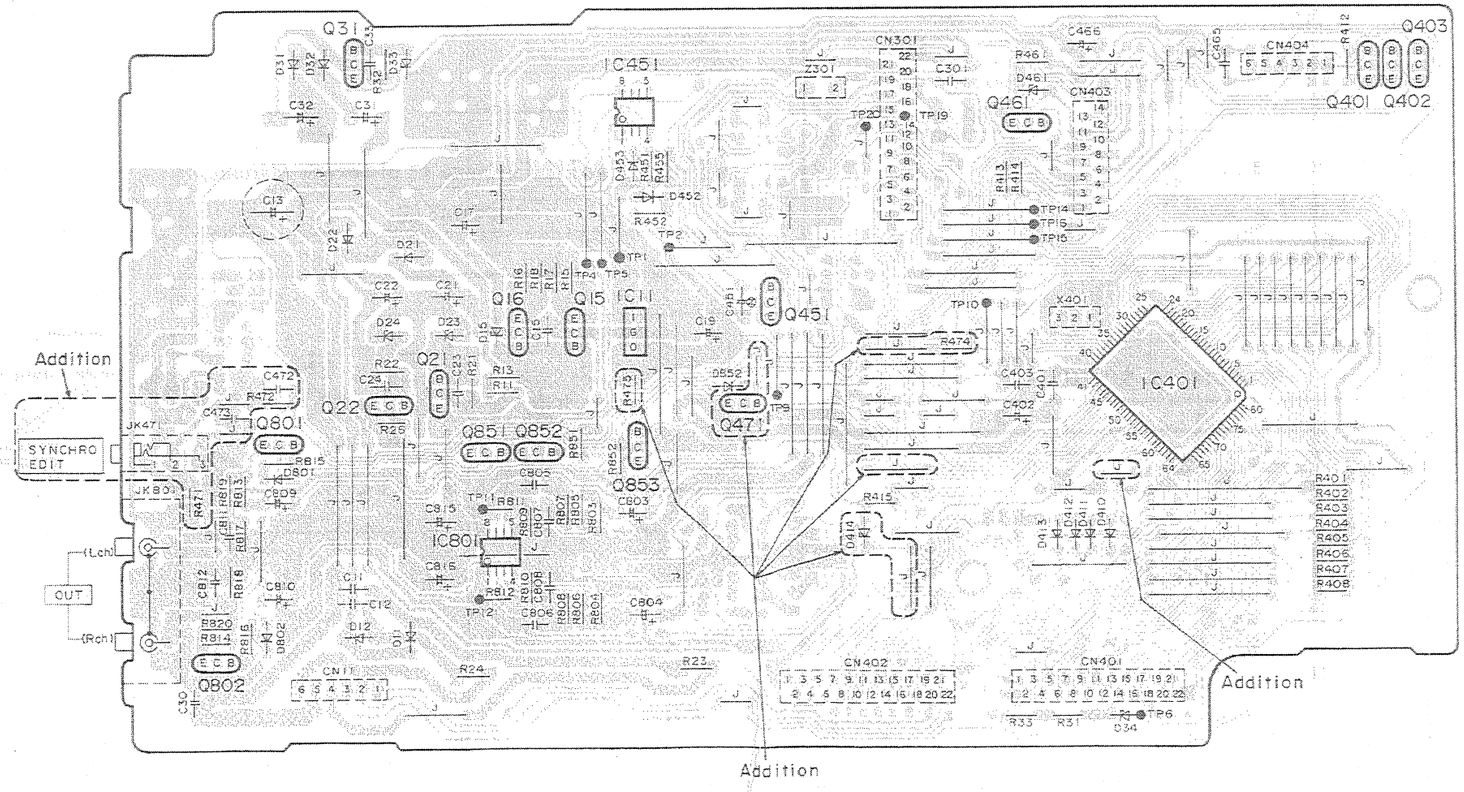
AC 110/127/220/240V (50/60Hz)

## PRINTED CIRCUIT BOARDS (page 41, 42 of Service Manual.)

### F OPERATION P.C.B. (REP1561D-S)




### G MAIN P.C.B. (REP1560E-M)







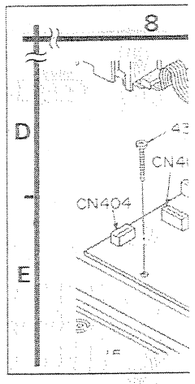

## WIRING C
(page 44 of Se
SL-PD647 (

G MAIN P.C.B.

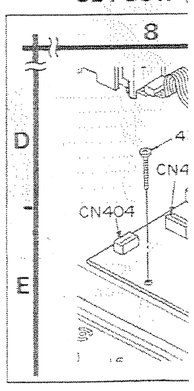
SL-PD847 (

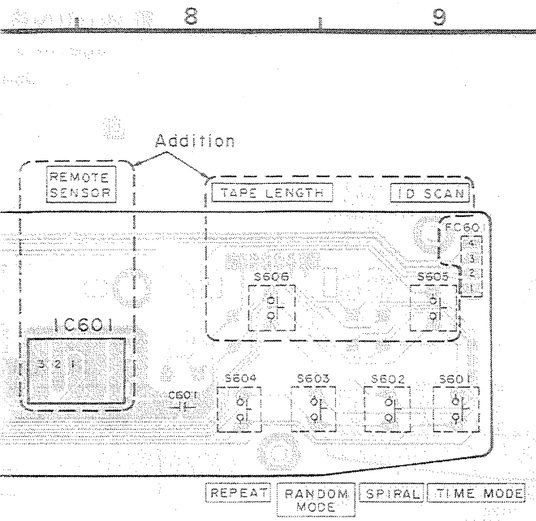
G MAIN P.C.B.

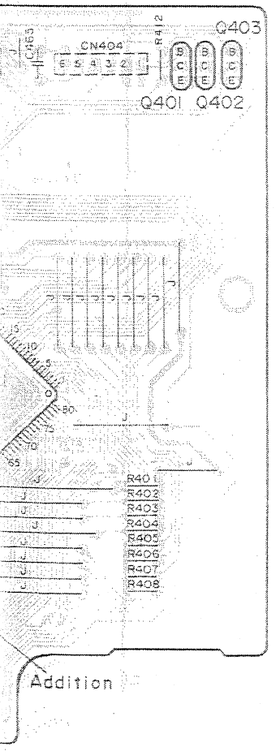
## EXPLODE
(page 50 of Se
SL-PD647 (




SL-PD847 (

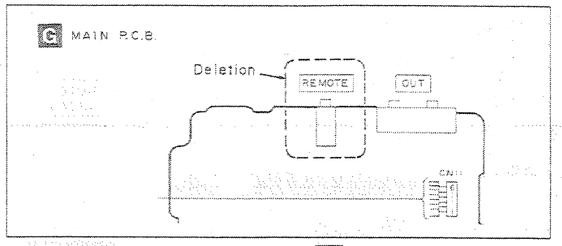




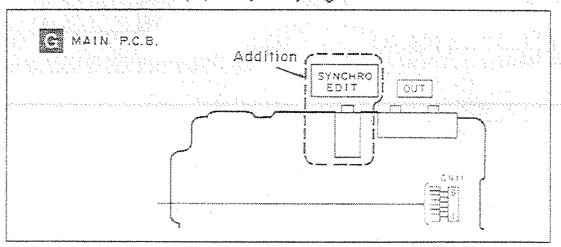




## WIRING CONNECTION DIAGRAM
(page 44 of Service Manual.)

SL-PD647 (E)

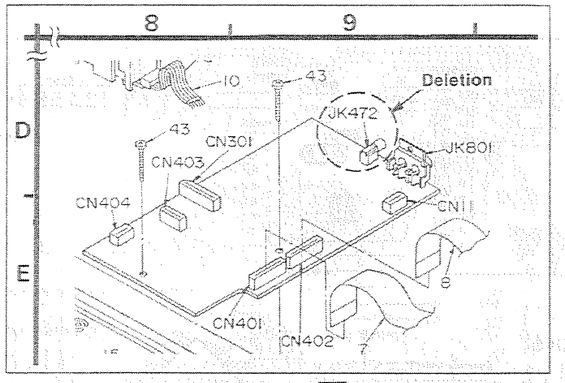



SL-PD847 (E, GC, GN)

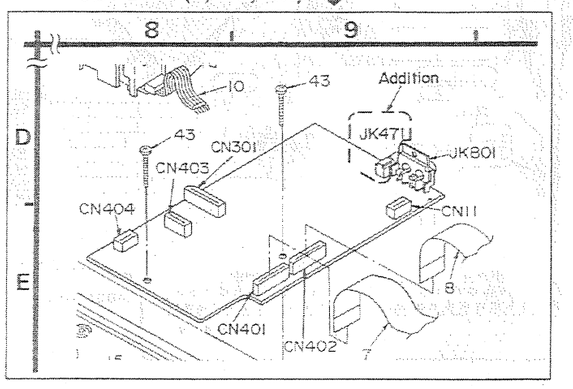



## EXPLODED VIEWS
(page 50 of Service Manual.)

SL-PD647 (E)

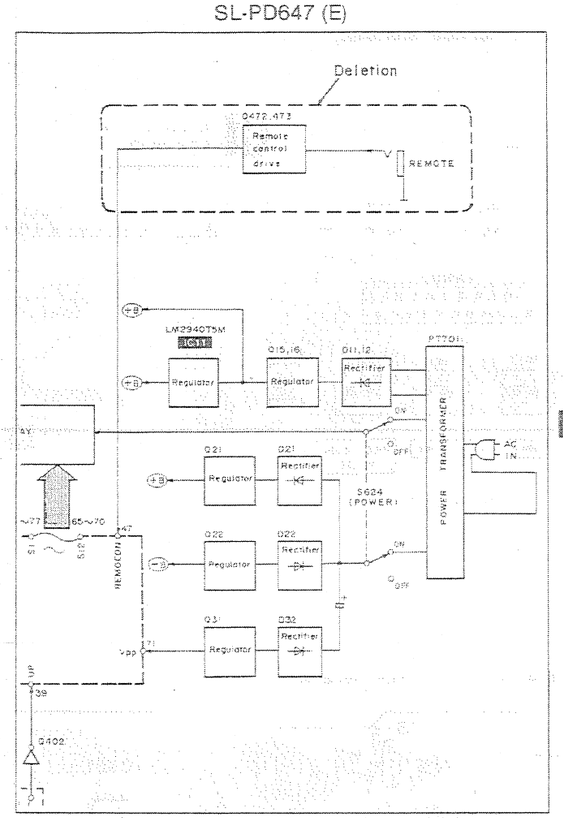



SL-PD847 (E, GC, GN)

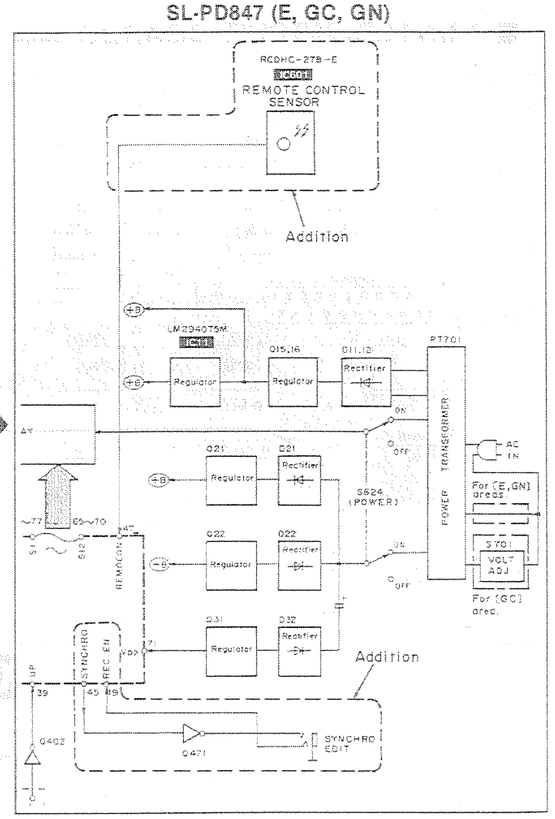



## BLOCK DIAGRAM (page 33 of Service Manual.)

SL-PD647 (E)

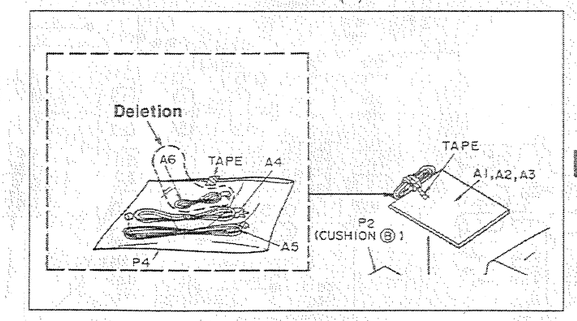



SL-PD847 (E, GC, GN)

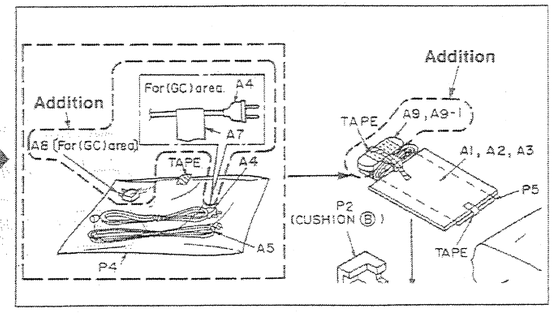



## PACKAGING (page 47 of Service Manual.)

SL-PD647 (E)




SL-PD847 (E, GC, GN)








Printed in Japan
H930412500 NH/YU/TN

V16435

ORDER NO. AD9903042S0
A6

# Service Manual

Supplement

Compact Disc Changer

Compact Disc Changer

SL-PD346
SL-PD346A
SL-PD347
SL-PD365
SL-PD365A
SL-PD647
SL-PD845
SL-PD847
SL-PD947

## This document is supplementary to the following Service Manuals:

| Model No. | Area Code | Order No. | |
|---|---|---|---|
| SL-PD346 | (P) (PC) | AD9206170C1 | — |
| SL-PD346A | (GN) | AD9306175A3 | — |
| SL-PD347 | (P) (PC) | AD9304154C1 | — |
| | (GN) | AD9306168A3 | — |
| SL-PD365 | (P) (PC) | AD9204122C1 | — |
| SL-PD365A | (P) (PC) | AD9301037C1 | — |
| SL-PD647 | (P) (PC) | AD9212420C1 | — |
| | (E) (GC) (GN) | AD9304104C8 | V00537 # 10/6/141 |
| SL-PD845 | (PP) | AD9301026A1 | — |
| SL-PD847 | (P) (PC) | AD9301013A1 | — |
| | (E) (GC) (GN) | AD9304121A8 | V16435 |
| SL-PD947 | (P) (PC) | AD9303072C1 | — |

**Colour**

(K) ... Black Type

**Areas**

P ..... U.S.A..
PC ..... Canada.
PP ..... U.S.A. and Canada.
E ..... Europe.
GC ..... Asia, Latin America, Middle Near East and Africa.
GN ..... Oceania.

## Purpose

Because of difficult to understand for part of "Operation Checks and Main Component Replacement Procedures" of Service Manual carried above, we amend by this supplement Service Manual.

**⚠ WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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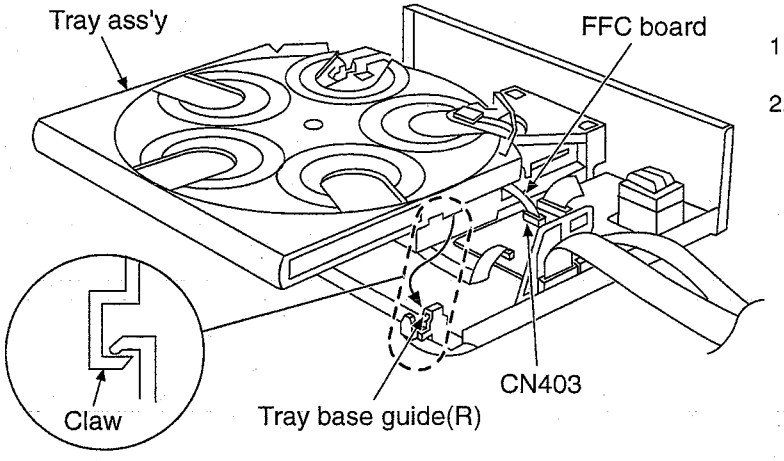
**CHANGE**

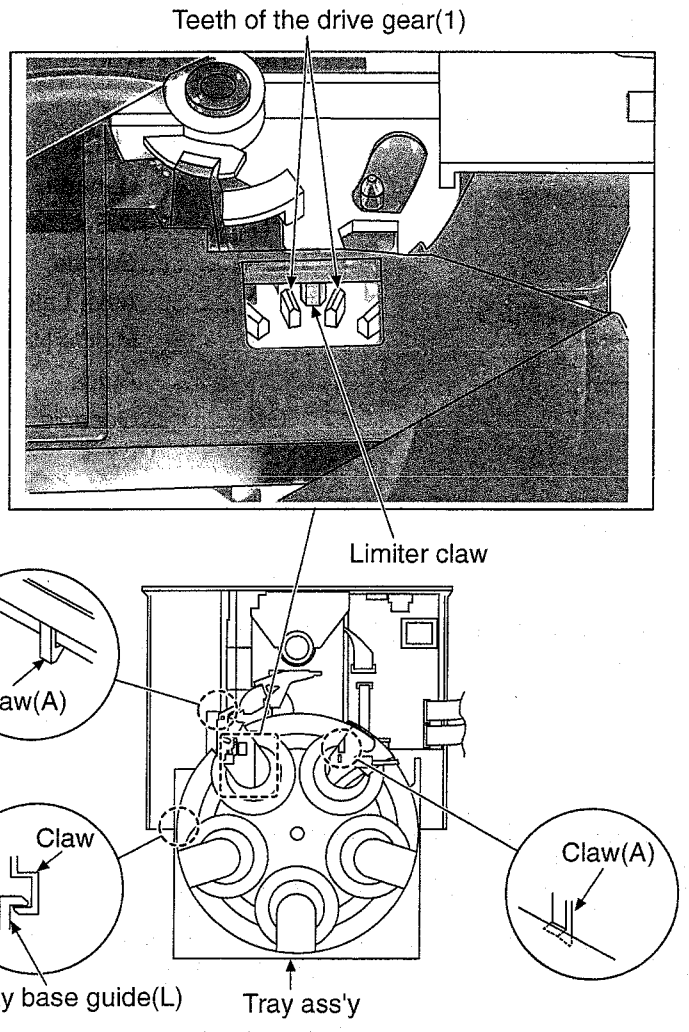
# DISASSEMBLY INSTRUCTIONS

[Refer to original Service Manual, item of "Installation of the tray ass'y".]

- **Installation of tray ass'y**




1. Attach the FFC board to the connector (CN403).
2. Fit the claws on the right side of the tray ass'y underneath the claws on the tray base guide (R).




3. Fit the claws on the right side of the tray ass'y underneath the claws on the tray base guide (L).
4. Fit the limiter claw on the tray ass'y between the teeth of the drive gear (1).
5. Catch the 2 claws (A) with the loading mechanism ass'y.
6. After installing the tray ass'y check that it moves smoothly.



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H990306200 TN/HH

ORDER NO. AD9410298S0
A6

# Service Manual

Supplement

Compact Disc Player

# SL-PD627
# SL-PD647
# SL-PD847

## Technical Guide
## &
## 5-CD Changer Service Hints

## CONTENTS


DISASSEMBLY AND REASSEMBLY OF LOADING MECHANISM ..... 1~3
LOADING MECHANISM PARTS LOCATION ..... 4
MECHANISM CONTROL CIRCUIT ..... 5
IC401 TERMINAL FUNCTION ..... 6
I. TRAY BASE LOADING (AT-STOP MODE) ..... 7~10
II. TRAVERSE ASCENDING/DESCENDING ..... 11, 12
III. TRAY BASE LOADING (AT PLAY MODE) ..... 13~16
IV. ROTARY TRAY ROTATION ..... 17~20
CHECKPOINTS ON FAILURE OF MECHANISM ACTION ..... 21~22



⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.


Technics®


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# DISASSEMBLY AND REASSEMBLY OF LOADING MECHANISM

- For the entire procedure of disassembly and reassembly, please refer to the Disassembly Instructions in the Service Manual.
- The following are the method of removing and mounting the tray base and the cautions required in mounting the loading mechanism parts (mainly gears).

## 1. How to remove the Tray Base

1-1. Pull out the tray base in the arrow ② direction while pushing the close lock lever in the arrow ① direction as shown in Fig. 1. (Tray Base OPEN)

1-2. Adjust the tray base claws and tray base guide (L) claws to the identical position as shown in Fig. 2.

1-3. While pushing the tray base claws in with a screwdriver or suchlike tool, lift up the tray base in the arrow-3 direction as shown in Fig. 3.

1-4. Then arrange the tray base right side claws and the tray guide (R) to be positioned as shown in Fig. 3.

1-5. After adjusting the right side clasw, further lift up the tray base left side in the arrow ③ direction and remove the right side claw.

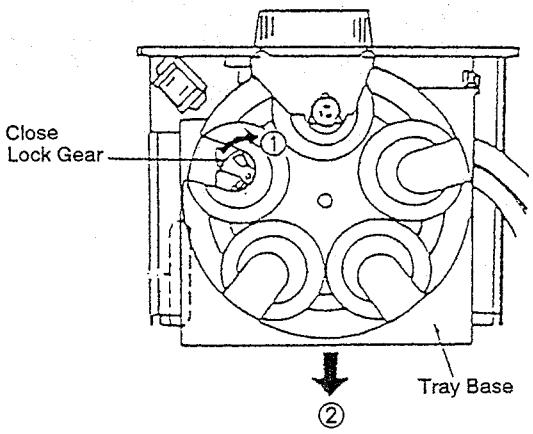



Fig. 1

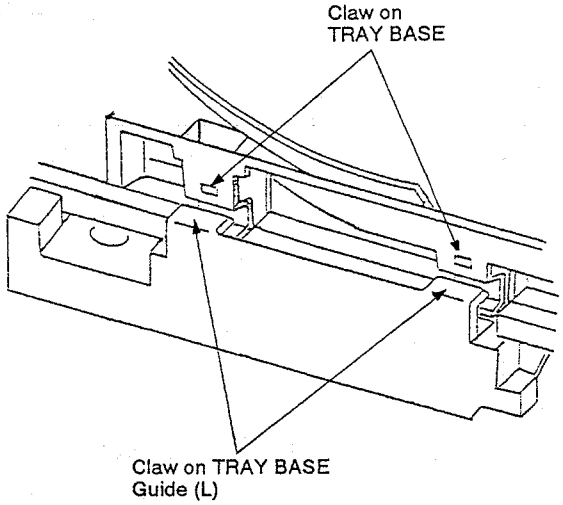



Fig. 2

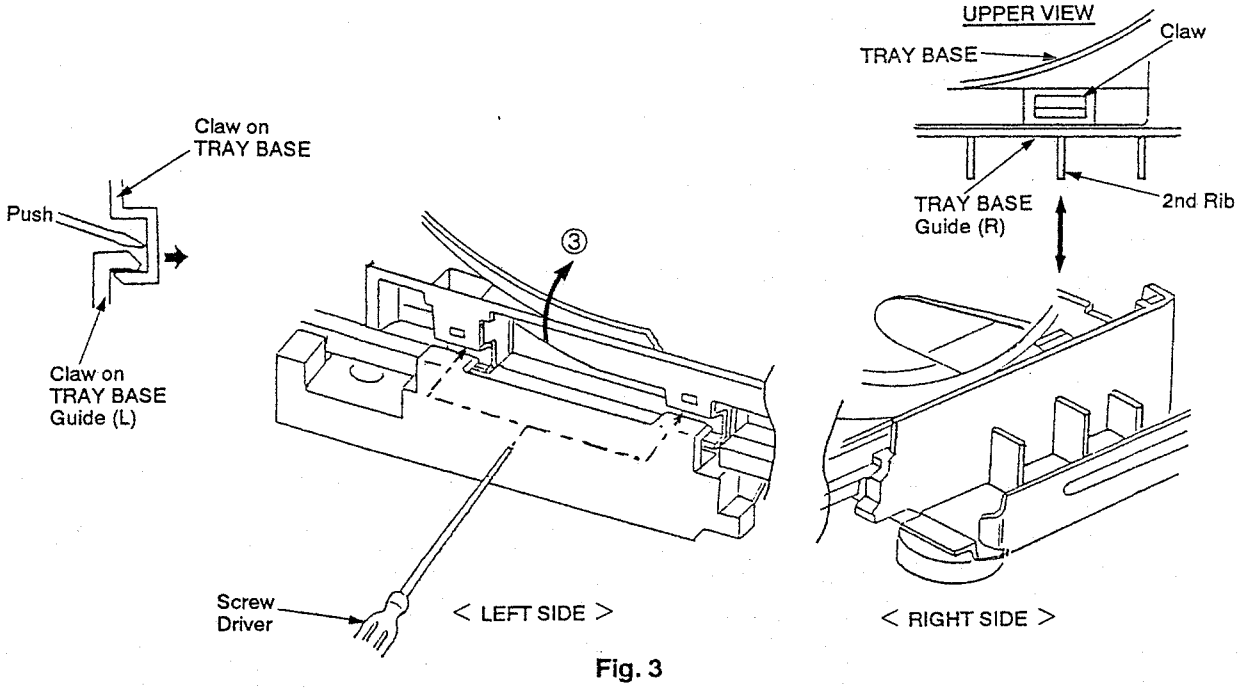



Fig. 3

## 2. Mounting the Tray Base

2-1. After arraning the tray base right side claw and the tray base guide (R) as shown in Fig. 4, lightly press the tray base in.

2-2. Make the left side tray base claws meet the tray base guide (L) claws correctly as shown in Fig. 5.
In case there is made a clearance between claws, the open lock lever is not in mesh with the mechanism gear correctly.
Moving the open lock lever right and left, position it to the left side.

2-3. When the claws are correctly positioned, press the tray base in from above.

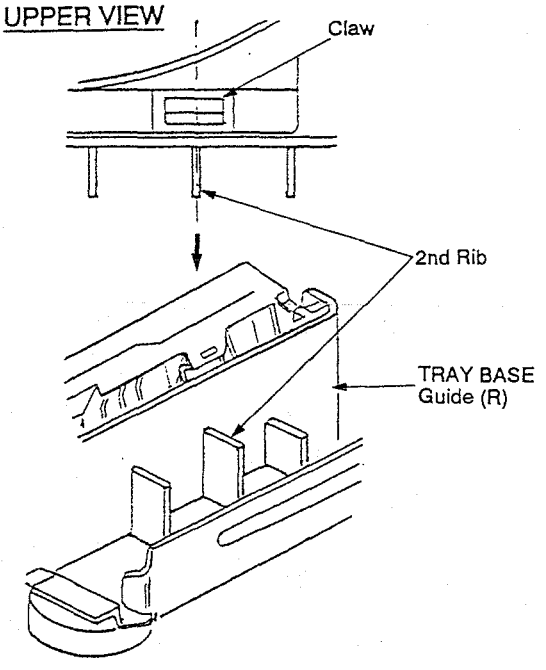



**Fig. 4**

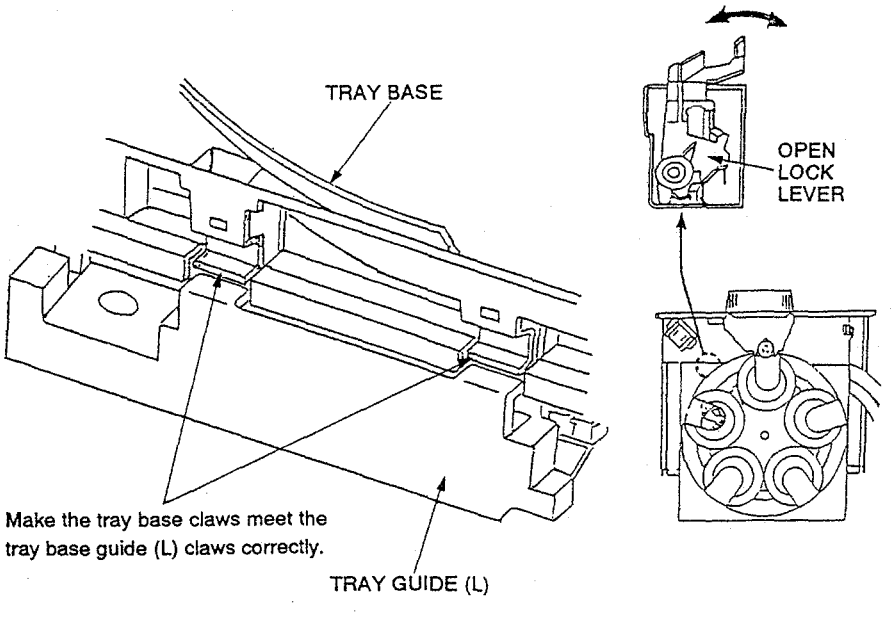



**Fig. 5**

## 3. Mounting the Mechanism Gears

- If the gears of the mechanism have been removed for repair of the mechanism, care should be taken about the following points when mounting the gears after repair.

3-1. The position of the drive cam to be set is shown in Fig. 6. Adjust the rib on the traverse base to the ▲ mark on the drive cam.

3-2. Likewise set the Elevation cam by adjusting the rib to the ▲ mark on the Elevation cam.
Since the Elevation cam and the drive cam are connected through gears, take care not to dislocate the drive cam when mounting the Elevation cam.

3-3. In the condition mentioned above, other gears are in the free state and require no special care.

3-4. After mounting the gears, mount the traverse.

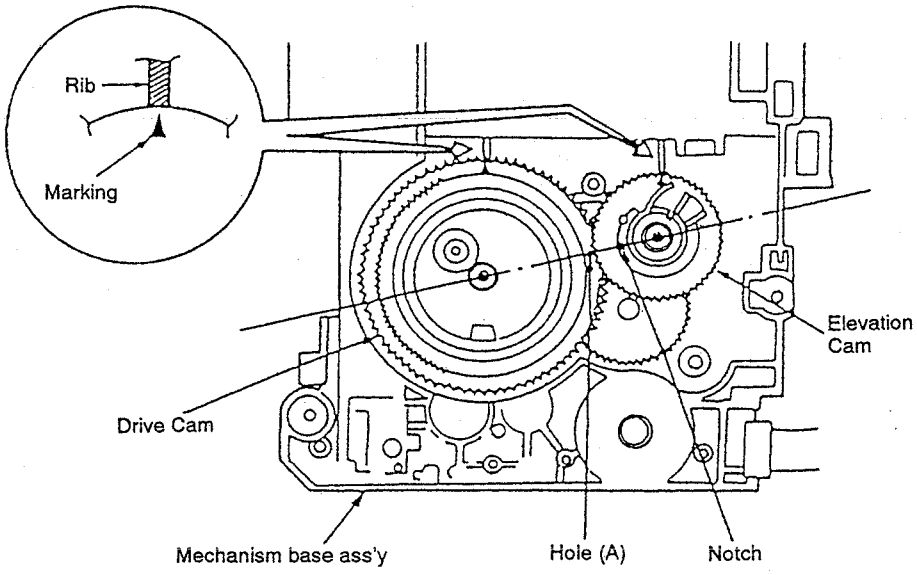



**Fig. 6**

## LOADING MECHANISM PARTS LOCATION

Fig. 7 shows location of the loading mechanism parts.

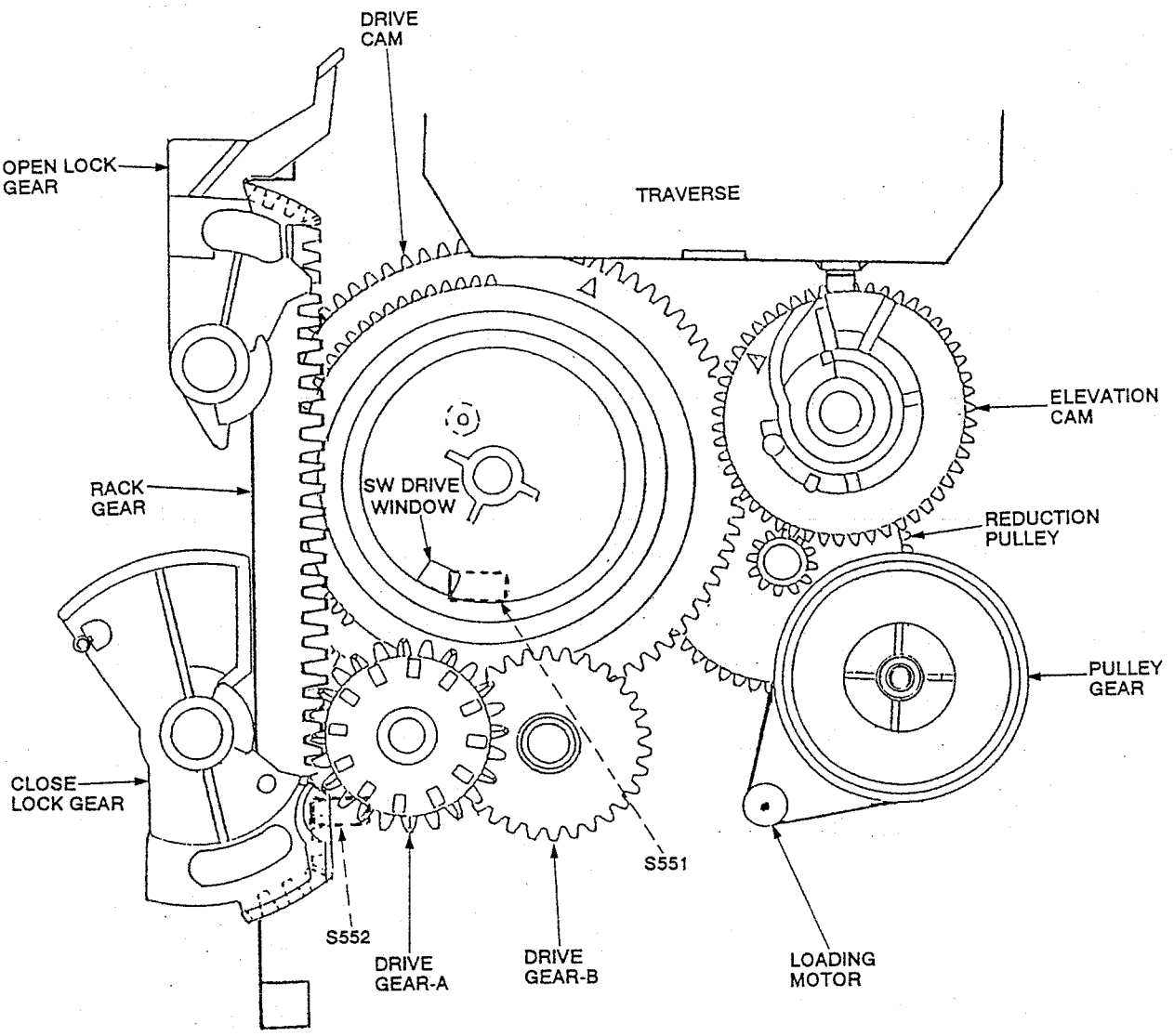



**Fig. 7**

1. Rack Gear mounted inside the Tray Base gets in mesh with Drive Gear A, and rotation of it causes the Tray Base to open or close.
2. Open Lock Gear and Close Lock Gear mounted to the Tray Base are used to fix the Tray Base in respective position when the Tray Base is opened or closed.
3. Elevation Cam, being turned, raises the Traverse (for play) or lower the Traverse (to stop).
4. Drive Cam transfers rotation to Drive Gears A and B, and is used to turn S551 ON and OFF.
5. S551 is turned ON and OFF by the SW Drive Window of the Drive Cam. S551 is a double switch comprising DOWN SW and UP SW.
6. S551, which is turned ON and OFF through actions of Open Lock Gear and Close Lock Gear, detects that the Tray Base has been opened or closed.

## MECHANISM CONTROL CIRCUIT

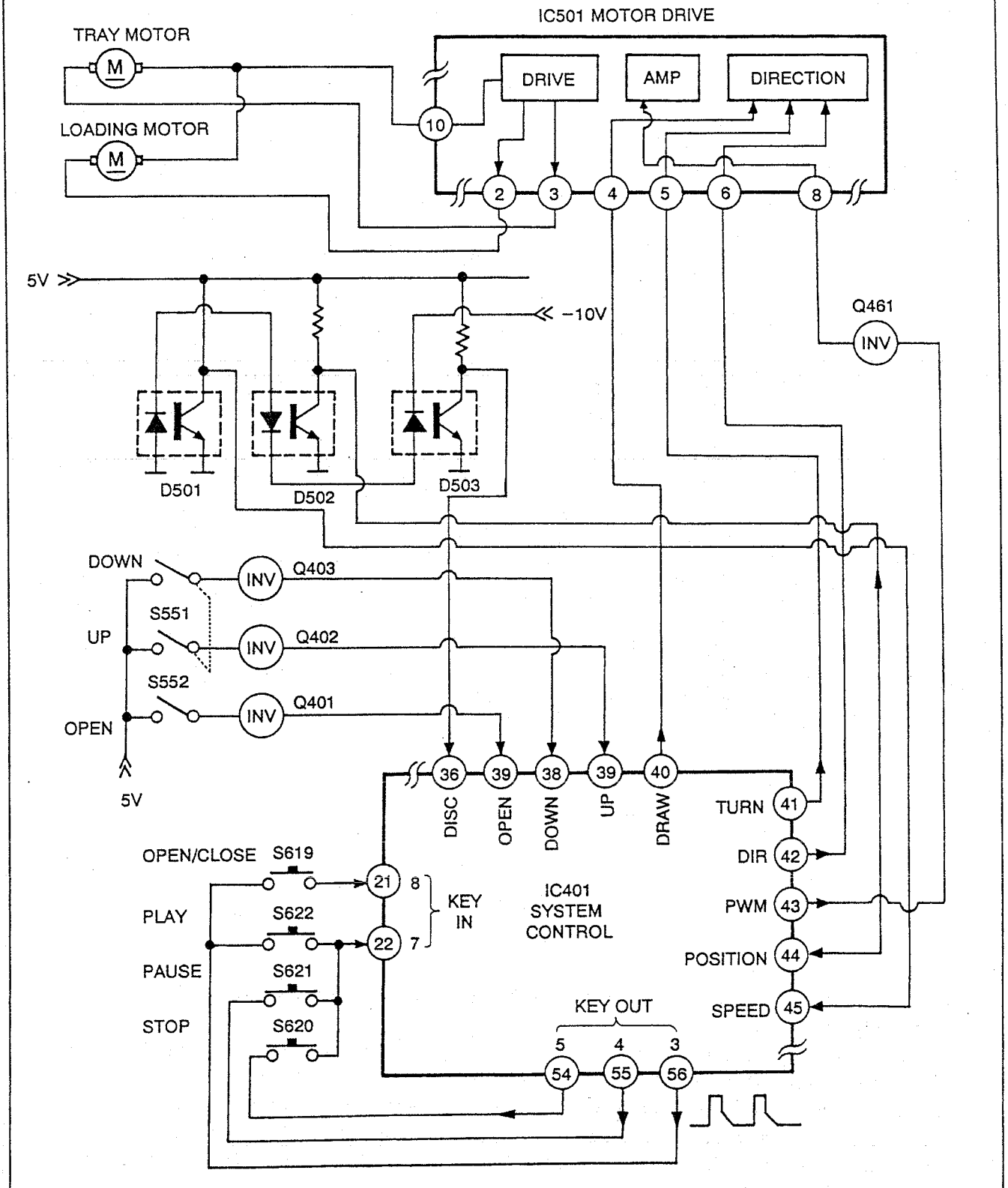



**Fig. 8**

## IC401 (SYSTEM CONTROL) TERMINAL FUNCTION

| Pin No. | Mark | Function |
|---|---|---|
| 36 | DISC | ◎ DISC detection input<br>• Whether DISC is in or out is detected by D503.<br>L level: DISC is in, H level: DISC is out. |
| 37 | OPEN | ◎ DRAWER OPEN detection input<br>• That the DRAWER has opened is detected through the action of S552.<br>S552 ON → L level (DRAWER OPEN) |
| 38 | DOWN | ◎ TRAVERSE DOWN (STOP) detection input<br>• That the TRAVERSE has descended is detected through the action of S551 (DOWN).<br>S551 (DOWN) ON → L level (Condition: S551 UP): OFF) |
| 39 | UP | ◎ TRAVERSE UP (PLAY) detection input<br>• That the TRAVERSE has ascended is detected through the action of S551 (UP).<br>S551 (UP) ON → L level (Condition: S551 (DOWN): OFF) |
| 40 | DRAW | ◎ LOADING MOTOR ROTATION command output<br>• H level: ROTATION, L level: STOP |
| 41 | TURN | ◎ TRAY MOTOR ROTATION command output<br>• H level: ROTATION, L levle: STOP |
| 42 | DIR | ◎ MOTOR ROTATIONAL DIRECTION command output<br>• Loading Motor • Tray Motor<br>H level: CCW H level: CCW<br>L level: CW L level: CW<br>(CW = clockwise, CCW = counterclockwise) |
| 43 | PWM | ◎ MOTOR DRIVE VOLTAGE command output<br>• Motor drive voltage from IC501 is made to change through generation of pulse and change of it in duty ratio. |
| 44 | POSITION | ◎ DISC No. detection input<br>• DISC No. is detected through input of the number of pulses by the slits on the disc detection ring of the tray and D502. |
| 45 | SPEED | ◎ SPEED detection pulse input<br>• Rotatinal speed of the TRAY is detected by inputting the pulses generated with D501 and the COUNT RING on WORM GEAR. |

# I. TRAY BASE LOADING

## 1. Traverse Down (STOP ) State

### A. Opening Action

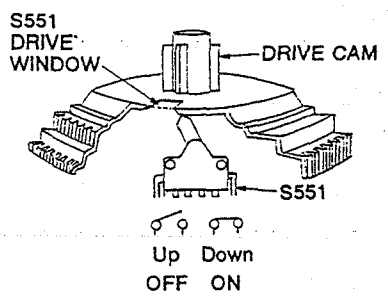
(Initial State of Mechanism and Control Circuit)

a) S552: OPEN (OFF)

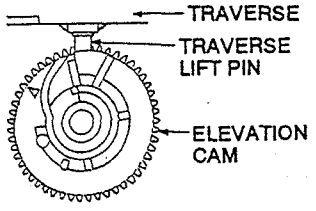
b) S551

Down: CLOSE (ON)

Up: OPEN (OFF)




c) Positional Relationship between Elevation Cam and Traverse Lift Pin.




d) Drive Gear-A and Drive Gear-B are in free run.

### Mechanism Action

Initial State:
* Traverse Down
* Tray Base Closed

Loading Motor rotates.
* Arrow ① direction

Elevation Cam rotates.
* Arrow ② direction

Drive Cam rotates.
* Arrow ③ direction

Drive Gear-A rotates.
* Arrow ④ direction
* When Pulley Gear rotates about one-third turn, Drive Cam's Gear ② gets in mesh with Drive Gear-A's Gear ② and Drive Gear-A rotates in arrow ④ direction. See Fig. 9, 10.

### Control Circuit Action

* Press Open/Close button.
* S619: ON

* IC401 (40): H
* IC401 (42): H

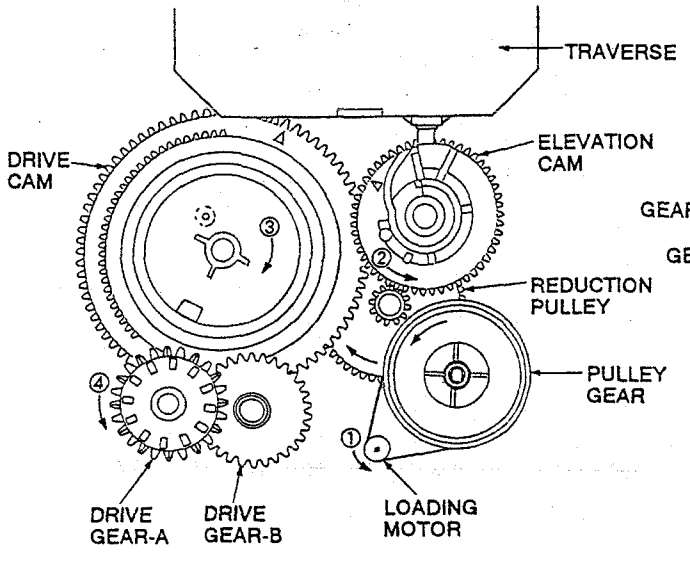



Fig. 9

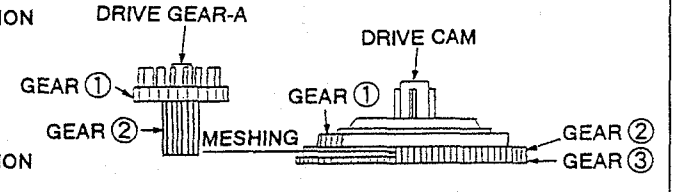



Fig. 10

Tray Base unlocking.
* Drive Gear-A makes Close Lock Gear rotate in arrow ⑤ direction.
* Close lock is unlocked. (Fig. 11)

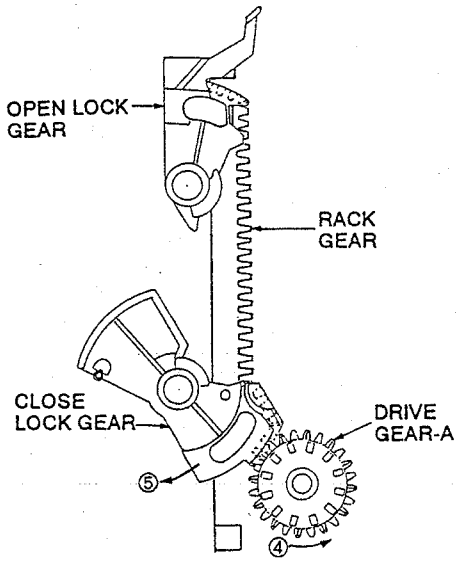
Tray Base opening.
* Dirve Gear-A gets in mesh with Tray Base's Rack Gear and moves Tray Base in arrow ⑥ direction. (Fig. 12)

Tray Base is completely open

Tray Base open-locking.
* Drive Gear-A makes Open Lock Gear rotate in arrow ⑦ direction till Tray Base is locked.
* At the same time, Open Lock Gear makes S552 turn on. (Fig. 13)

Motor stopping.
* As S552 turns on, Motor stops rotating. (Fig. 14)

Tray Base opening action is over.




S552: ON

Fig. 11

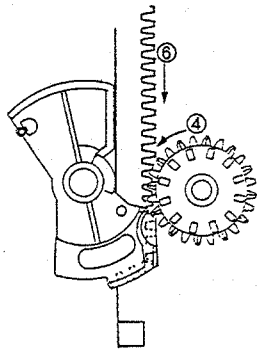



Fig. 12

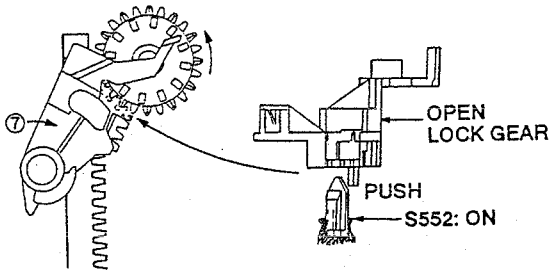



Fig. 13

Fig. 14

**B. Closing Action**

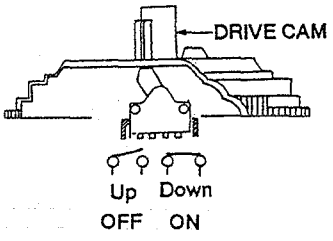
(Initial State of Mechanism and Control Circuit)

a) S552: CLOSE (ON)

b) S551

Down: CLOSE (ON)

Up: OPEN (OFF)




c) Gears are positioned as shown in Fig. 15.

| Mechanism Action | Control Circuit Action |
|---|---|
| Initial State:<br>* Traverse Down<br>* Tray Base Opened | * Press Open/Close button.<br>* S619: ON |
| Loading Motor rotates.<br>* Arrow ① direction | * IC401 (40): H<br>* IC401 (42): L |
| Open lock unlocking<br>* Each gear shown in Fig. 15 rotates in arrow direction, and Drive Gear-A rotates in arrow ④ direction.<br>* Drive Gear-A makes Open Lock Gear rotate in arrow ⑤ direction till open lock is unlocked. (Fig. 16)<br>* At the same time S552 opens (turns OFF). (Fig. 14) | S552: CLOSE (ON)<br>↓<br>OPEN (OFF) |
| Tray Base closing<br>* Drive Gear-A gets in mesh with Tray Base's Rack Gear. Accordingly Tray Base is moved in arrow ⑥ direction and closes. (Fig. 17) | |

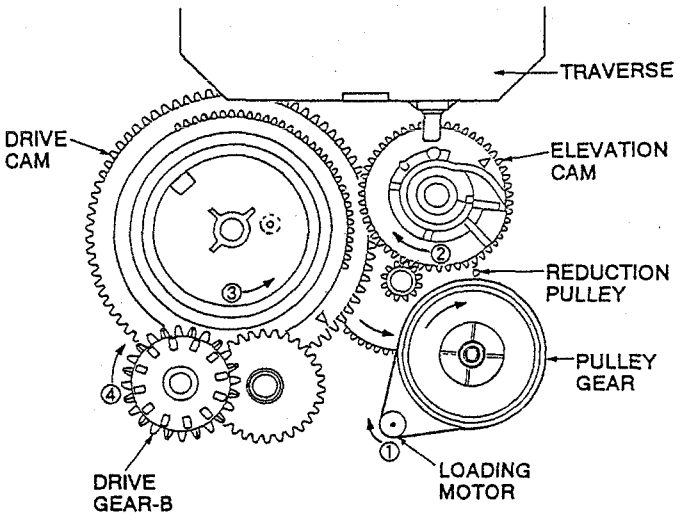



Fig. 15

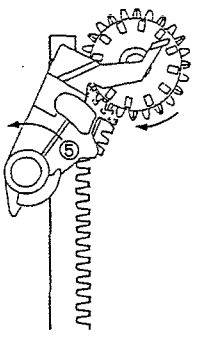


Fig. 16

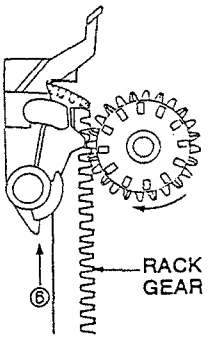



Fig. 17

Tray Base closed completely.

Tray Base closed locking.
* When Tray Base is closed completely, Drive Gear-A gets out of mesh from Drive Cam and Drive Gear-A is placed into free run. (Fig. 18)
* As Drive Gear-A is placed into free frun,. pressure of spring causes Close Lock Gear to rotate in arrow ⑦ direction till Tray Base locked. (Fig. 19)

Motor rotates, and as Drive Cam turns off S551 (Down), Motor reverses. (Fig. 20-1)
* As Motor reverse, S551 (Down) is again turned on. (Fig. 20-2)

S551 (Down): OFF
↓
S551 (Down): ON

Motor stops rotating.
* As S552 (Down) is turned on, Motor stops rotating.

Closing action is over.

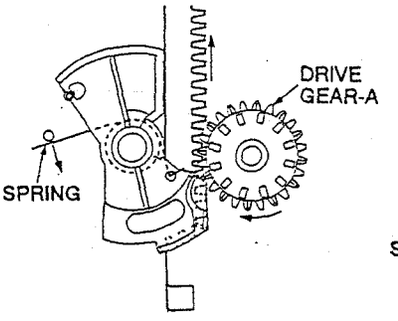



Fig. 18

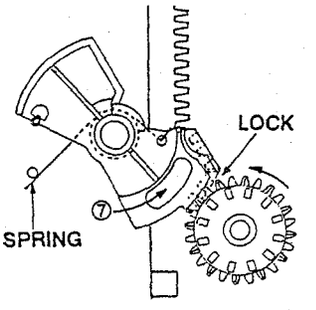



Fig. 19

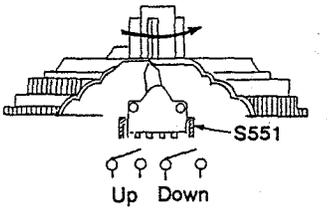



Fig. 20-1

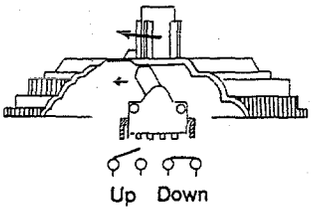



Fig. 20-2

# II. TRAVERSE ASCENDING/DESCENDING

## 1. Traverse Ascending

(Initial State of Mechanism and Control Circuit)

a) S552: OFF

b) S551

Down: CLOSE (ON)

Up: OPEN (OFF)

c) Gears and Traverse Lift Pin are positioned as shown in Fig. 21.

d) Drive Gear-A and Drive Gear-B are in the state of free run.

| Mechanism Action | Control Circuit Action |
|---|---|
| Initial State:<br>* Traverse Down<br>* Tray Base Closed | * Press PLAY button.<br>* S622: ON |
| Loading Motor rotates.<br>* Arrow ① direction | * IC401 (40): H<br>* IC401 (42): L |
| Elevation Cam rotates.<br>* Arrow ② direction | |
| Traverse starts ascending.<br>* Lift Pin of Traverse goes up slope of Elevation Cam in (A) direction. (Fig. 22)<br>* At the same time, Drive Cam rotates in arrow ③ direction, thereby turning off S551 (Down). | S551 (Down): OFF |
| Rotating in the same direction, Drive Cam turns on S551 (Up). (Fig. 23) | S551 (Up): ON |
| Motor stops rotating.<br>* As S551 (Up) turns on, Motor stops rotating. (Fig. 23) | |
| Traverse ascending action is over. | |

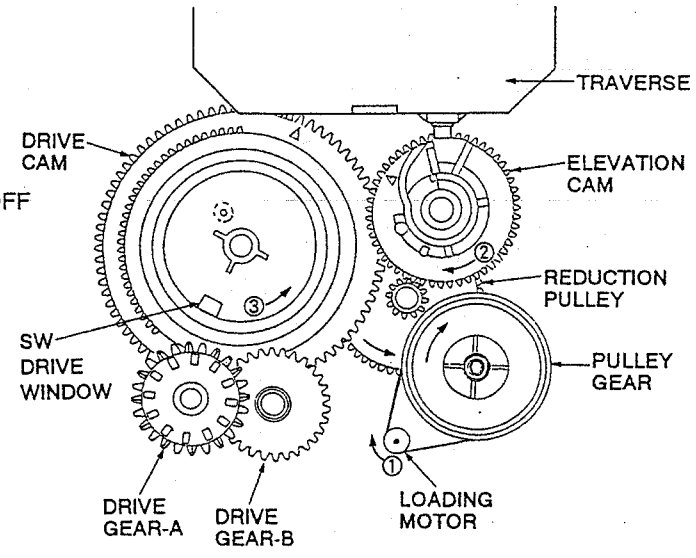
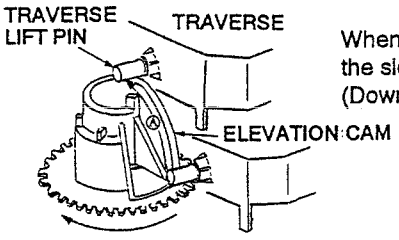
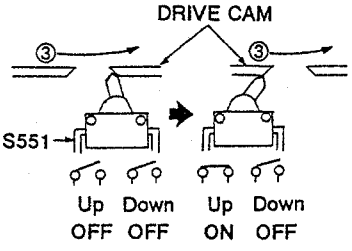



Fig. 21




When Traverse starts ascending the slope of Elevation Cam, S551 (Down) turns off.

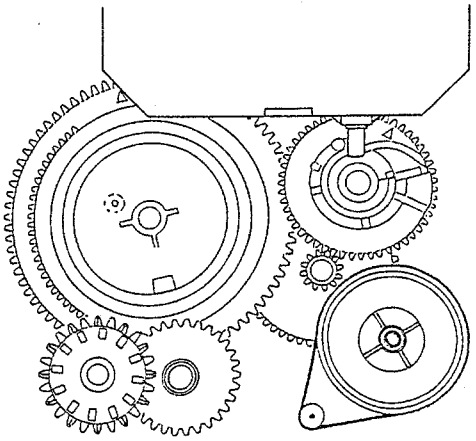
Fig. 22




When Traverse gets in fixed position of Up, S551 (Up) turns on.

Fig. 23

Positional Relation of Mechanism and Switches when Traverse is Up (PLAY mode).



S552: OFF

S551

Down: OFF

Up: ON

Fig. 24

## 2. Traverse Descending

(Initial State of Mechanism and Control Circuit)

a) S552: OFF

b) S551

Down: OPEN (OFF)

Up: CLOSE (ON)

c) Gears and Traverse Lift Pin are positioned as shown in Fig. 25.

d) Drive Gear-A and Drive Gear-B are in free run.

| Mechanism Action | Control Circuit Action |
|---|---|
| Initial State:<br>* Traverse Up<br>* Tray Base Closed | * Press STOP button.<br>* S620: ON |
| Loading Motor rotates.<br>* Arrow ① direction | * IC401 (40): H<br>* IC401 (42): H |
| Elevation Cam rotates.<br>* Arrow ② direction | |
| Drive Cam rotates.<br>* Arrow ③ direction.<br>* Drive Cam Switch Drive Window turns off S551 (Up). (Fig. 26) | |
| Traverse Down.<br>* Elevation Cam keeps rotating, and Traverse Lift Pin goes down slope of Elevation Cam. (Fig. 27) | |
| S551 (Down) ON<br>* Drive Cam keep rotating and Switch Drive Window turns on S551 (Down). (Fig. 28) | S551 (Down): ON |
| Motor stops rotating.<br>* As S551 (Down) turns on, Motor stops rotating. | |
| Traverse ascending action is over. | |

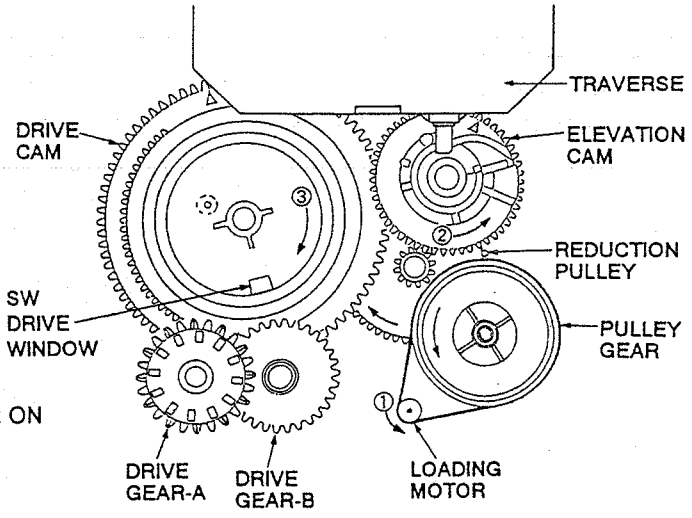



Fig. 25

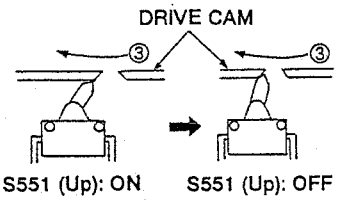



Fig. 26

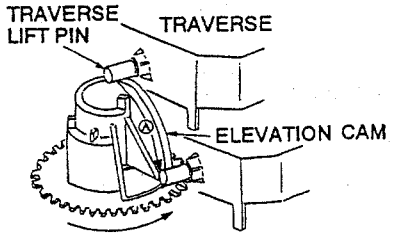



Fig. 27

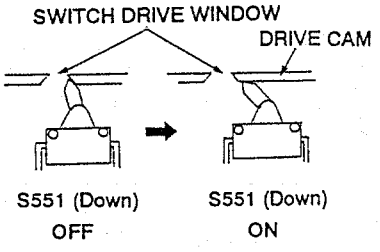


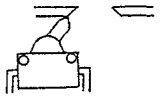

Fig. 28

# III. TRAY BASE LOADING

## 1. Traverse Up (PLAY) State

**A. Opening Action**

(Initial State of Mechanism and Control Circuit)
a) S552: OPEN (OFF)
b) S551
Down: CLOSE (ON)
Up: OPEN (OFF)



c) Gears and Traverse Lift Pin are positioned as shown in Fig. 29.
d) Drive Gear-A and Drive Gear-B are in free run.

| Mechanism Action | Control Circuit Action |
|---|---|
| Initial State:<br>* Traverse Up (PLAY)<br>* Tray Base Closed | * Press Open/Close button.<br>* S619: ON |
| Loading Motor rotates.<br>* Arrow ① direction | * IC401 (40): H<br>* IC401 (42): L |
| Elevation Cam rotates.<br>* Arrow ② direction | |
| Drive Cam rotates.<br>* Arrow ③ direction | |
| Drive Gear-B rotates.<br>* Arrow ④ direction.<br>* After one turn of pulley Gear, Drive Cam Gear ① gets in mesh with Drive Gear-B's Gear ②, and Drive Gear-B rotates in arrow ④ direction. (Fig. 30)<br>* Rotation of Drive Gear-B causes Drive Gear-A to rotate in arrow ⑤ direction. | |

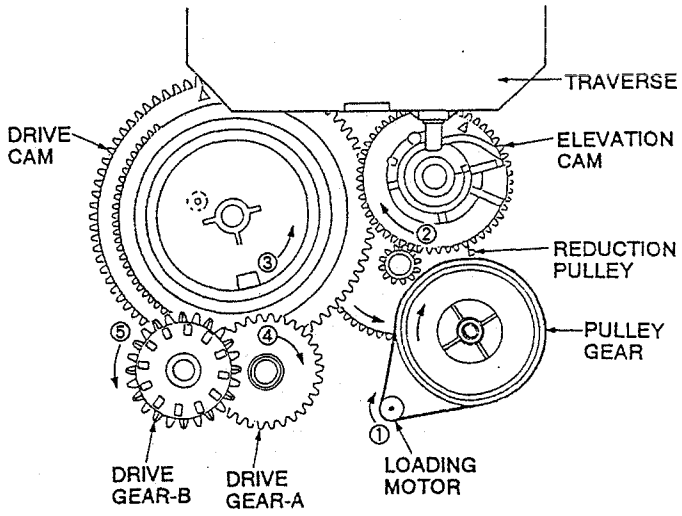



Fig. 29

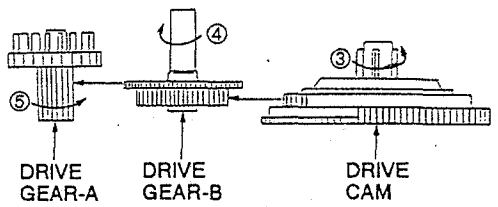



Fig. 30

Tray Base unlocking
* Drive Gear-A makes Close Lock Gear rotate in arrow ⑥ direction.
* Close lock is unlocked. (Fig. 31)

Tray Base opening
* Drive Gear-A gets in mesh with Tray Base's Rack Gear and moves Tray Base in arrow ⑦ direcitron. (Fig. 32)

Tray Base is completely open.

Tray Base open locking
* Drive Gear-A makes Open Lock Gear rotate in arrow ⑧ direction and accordingly Tray Base is open-locked.
* At the same time, Open Lock Gear turn on S552 .

Motor stops rotating.
* As S552 turns ON, Motor stops rotating.

Tray Base opening action is over.

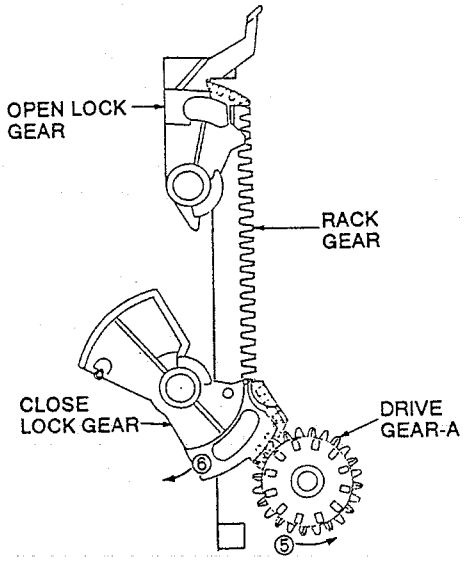



Fig. 31

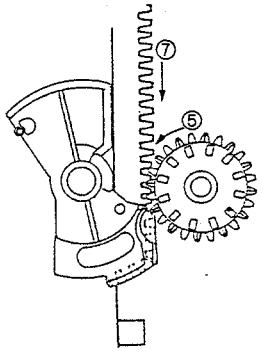



Fig. 32

S552 : ON

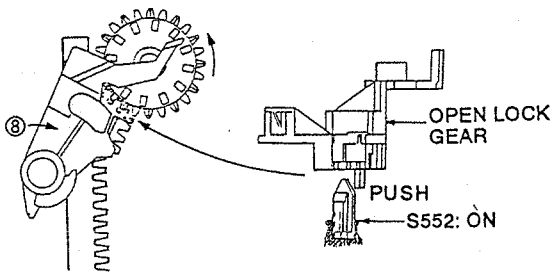



Fig. 33

Elevation Cam position and Traverse Lift Pin Position when opening action is over.

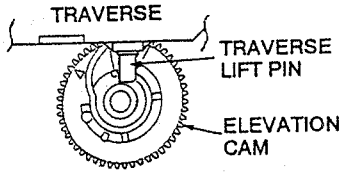



Fig. 34

## B. Closing Action

(Initial State of Mechanism and Control Circuit)

a) S552: CLOSE (ON)

b) S551

Down: OPEN (OFF)

Up: CLOSE (ON)

c) Gears and Traverse Lift Pin are positioned as showned in Fig. 35.

| Mechanism Action | Control Circuit Action |
|---|---|
| Initial State:<br>* Traverse Up<br>* Tray Base Opened | * Press Open/Close button.<br>* S619: ON |
| ↓ | |
| Loading Motor rotates.<br>* Arrow ① direction | * IC401 ㊵: H<br>* IC401 ㊷: H |
| ↓ | |
| Open lock unlocking<br>* Gears and cams rotate as shown in Fig. 35, and Drive Gear-A rotates in arrow ⑤ direction.<br>* Drive Gear-A makes Open Lock Gear rotate in arrow ⑥ direction till open lock is unlocked. (Fig. 36)<br>* At the same time, S552 opens (OFF). | S552: CLOSE (ON)<br>↓<br>OPEN (OFF) |
| ↓ | |
| Tray Base starts closing.<br>* Drive Gear-A keeps rotating, gets in mesh with Tray Base's Rack Gear and moves Tray Base in arrow ⑦ direction so that Tray Base starts closing. (Fig. 37) | |

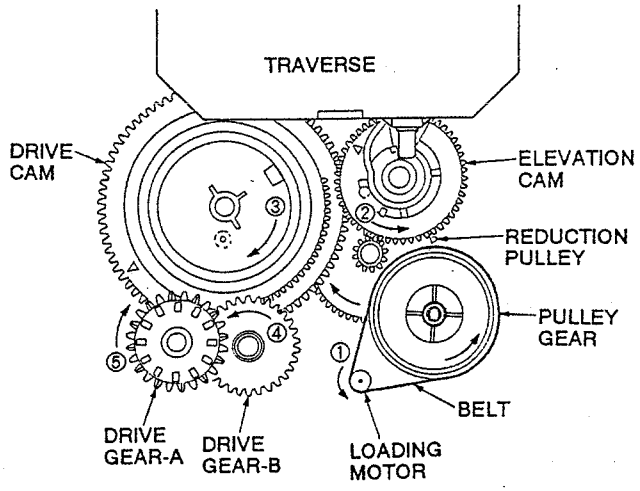



Fig. 35

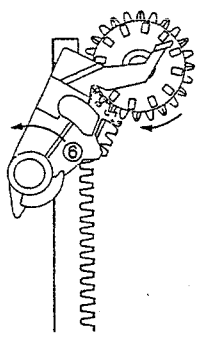


Fig. 36

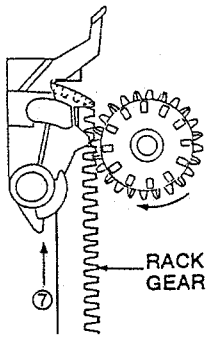



Fig. 37

Tray Base closed completely.

↓

Tray Base close-locking.
* When Tray Base is closed completely, Drive Gear-B moves away from Drive Cam having been in mesh with. (Fig. 38)
  Drive Gear-A and Drive Gear-B are placed into free run.
* As Drive Gear-A is placed into free run, pressure of spring causes Close Lock Gear to rotate in arrow ⑧ direction and Tray Base is locked. (Fig. 39)

↓

* Rotation of Motor turns off S551 (Up), and as S551 (Up) turns off, Motor reverses. (Fig. 40)
* As Motor reverses, S551 (Up) turns on again.

S551 (Down): OFF

S551 (Down): ON

↓

Motor stops rotating.
* As S551 (Up) is turns on, Motor stops rotating.

↓

Closing action is over.

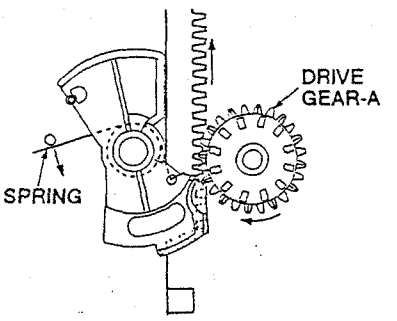



Fig. 38

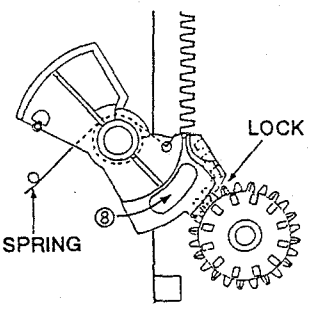



Fig. 39

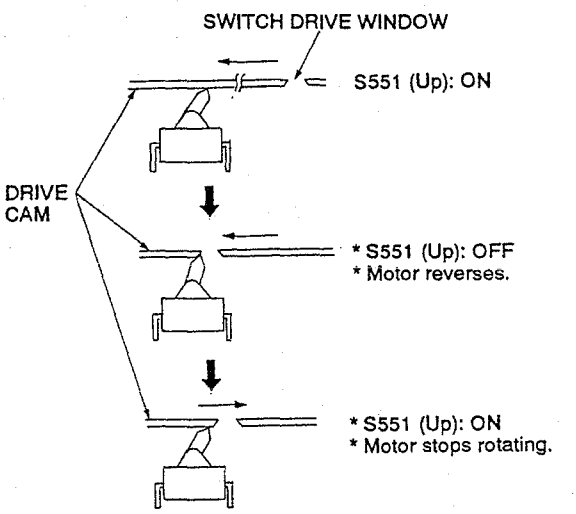



Fig. 40

# IV. ROTARY TRAY ROTATION

## 1. Initialization of Disc (Rotary Tray) Position.

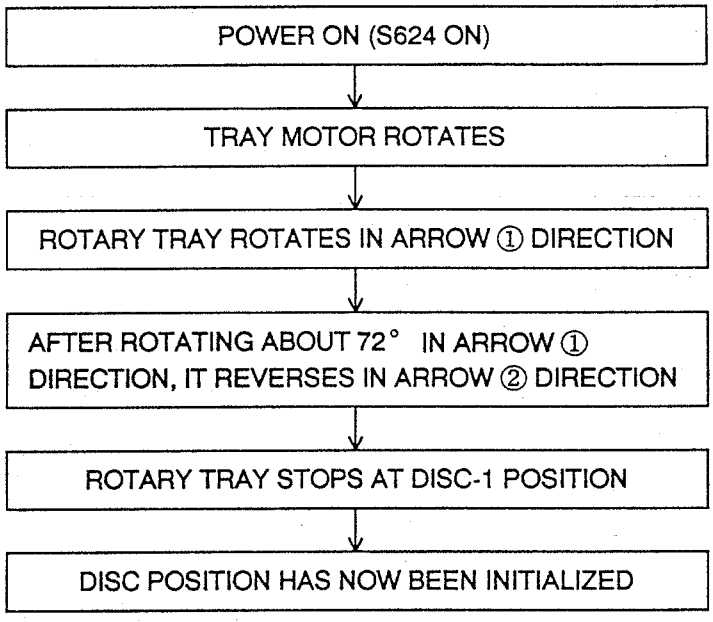
It may occur that the rotary tray stops outside the disc position when the power source is turned off during rotation of the rotray tray.

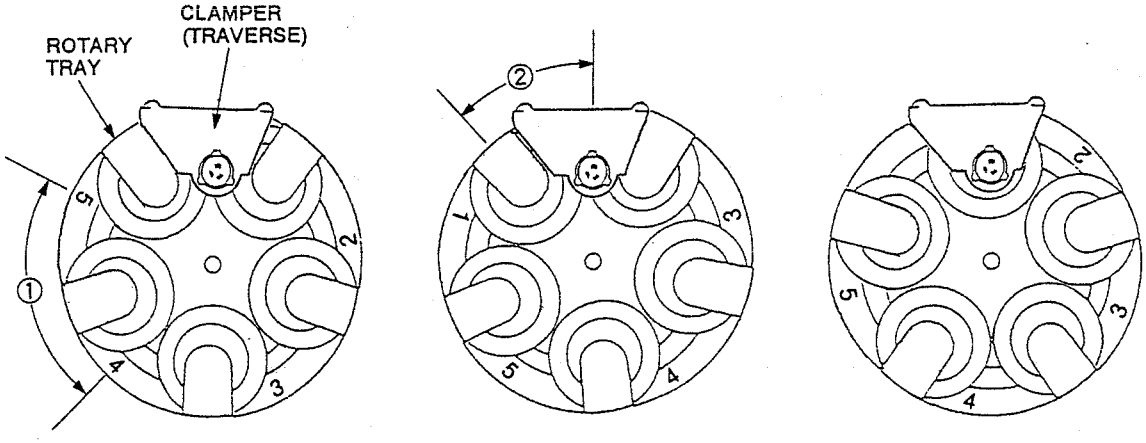
For the next operation, the rotary tray position is initialized when the power source is turned on, so that the rotary tray can start at the normal disc position.

The same initialization takes place even with the rotary tray having stopped at the normal disc position.

**Initialization (see Fig. 41)**

The flow chart below shows an example when the rotary tray is at a stop between Disc 5 and Disc 1.


POWER ON (S624 ON)
TRAY MOTOR ROTATES
ROTARY TRAY ROTATES IN ARROW ① DIRECTION
AFTER ROTATING ABOUT 72° IN ARROW ① DIRECTION, IT REVERSES IN ARROW ② DIRECTION
ROTARY TRAY STOPS AT DISC-1 POSITION
DISC POSITION HAS NOW BEEN INITIALIZED




a) ROTARY TRAY HAS STOPPED BETWEEN DISC-5 AND DISC-1

b) UNDER DETECTION OF DISC POSITION.

c) ROTARY TRAY HAS STOPPED AT DISC-1

**Fig. 41**

## 2. Principles of Rotary Tray Position.

The rotary tray rotates and stops on the basis of the following actions:

a) Rotation of the tray motor, transferred through the belt, rotates the worm gear. Consequently the gear under the rotary tray in mesh with the worm gear is driven and the rotary tray rotates.

b) The disc position is detected by the disc position detection ring (mounted to the underside of the rotary tray) and photo coupler D502.

c) Stopping of the rotary tray at the fixed disc position is controlled by the count ring (mounted to the worm gear) and photo coupler D501.

d) Whether the disc is in or not is detected through deteciton of reflected ray from the disc by photo coupler D503.

**DISC TRAY LOWER VIEW**

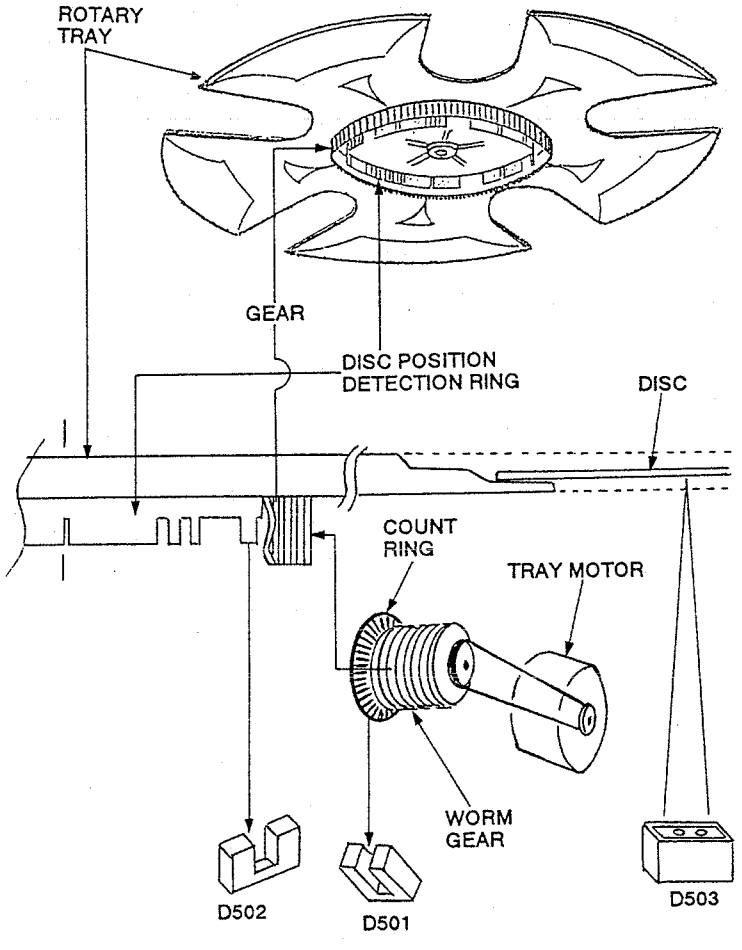



**Fig. 42**

## 3. Rotary Tray Position and Timing Chart

Fig. 43 shows an example when the rotary tray is at the position of Disc 5.

a) Disc-5 is in the PLAY mode.

b) Playback of Disc-5 is over.

c) The tray motor starts rotation, rotates the worm gear and rotates the rotary tray counterclockwise. At the same time, rotation of the worm gear causes the count ring to rotate and D501 to begin pulse count.

d) The rotary tray rotates, and while slit Ⓐ of Disc 1 passes D502, D501 counts the number of pulses by the count ring. (252 pulses)

e) Within the last pulse counted by D501, D502 detects edge B to determine the disc number. In this connection, Pulse 1 is detected at Ⓐ of Disc-1, Pulse 2 at Disc-2, ···· and pulse 5 at Ⓐ' of Disc-5 by D502, and thus the disc number is determined.

f) After detection of edge B, voltage supplied to the tray motor reduces gradually and the rotary tray rotation speed lowers.

g) At the time when D502 detects edge Ⓒ, the tray motor is supplied with negative voltage (pulse) and it is braked to a stop.

h) The above-mentioned steps are applied as actions from start to stop of Disc-1 ~ Disc-5.

i) Fig. 44 shows construction of slits corresponding to Nos. of discs for the disc position detection ring of the disc tray.

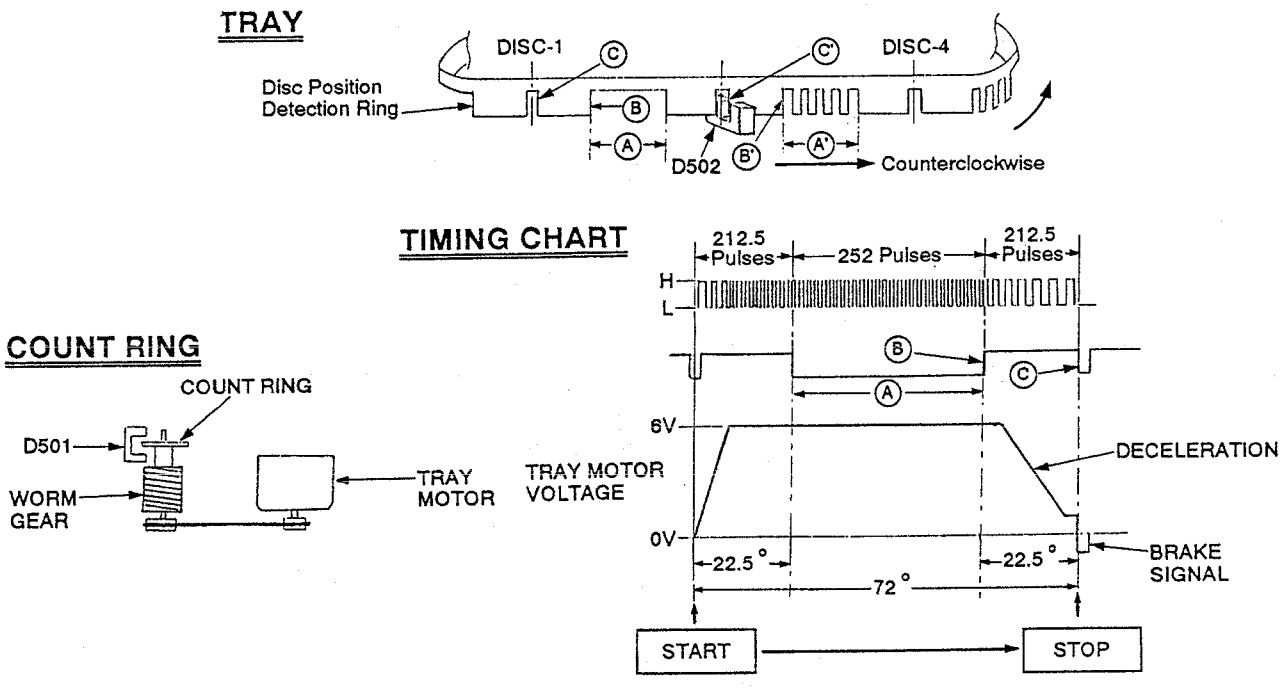



Fig. 43

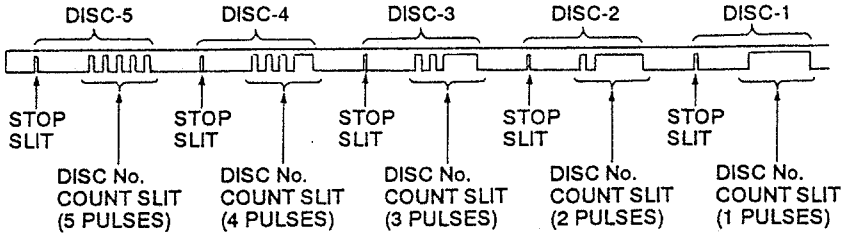



Fig. 44

## 4. Rotary Tray Rotation

The flow chart below shows standard actions. When skip takes place, the direction of rotation may differ depending on the condition of the loaded disc or on whether there is or there is not a loaded disc.

Key Operation
* Press the DISC SKIP button or press the PLAY button. S618 of S622 : ON

*In the case that no disc has been loaded, pressing the PLAY button also causes the disc tray to rotate to check if there is a disc.

↓

The tray motor rotates.
* In arrow ① direction. (Fig. 45)
* Motor voltage rises gradually to secure smooth rotation. (see Fig. 43)

↓

Worm Gear Rotation
* In arrow ② direction. (Fig. 45)

↓

Rotary Tray Rotation
* Depending on the rotary tray gear in mesh with the worm gear, the rotary tray rotates in arrow ③ direction.
* At the same time, the disc position detection ring attached to the rotary tray also rotates.

↓

Disc Number Detection
* During 252 pulses by D501 and the count ring, D502 count the number of pulses by the disc number slits and detects the Disc No.

↓

Rotary Tray Deceleration
* After Point B (see Fig. 43) of the disc detection ring of the rotary tray passes D502, D501 and the count ring jointly start detectin of speed.
* Deceleration begins toward the stop point.

↓

Tray Rotation Stop Command
* At the time when Point C of the disc detection ring passes D502, the tray motor stops.
* In order to prevent inertial rotation, brake signal (inverse voltage) is output. (see Fig. 43)

↓

The tray stops rotating.

Start of pulse Count
* The count ring starts rotation.
* Pulse count is started by the count ring slits and D501.

↓

The number of pulses counted is used for detection of Disc No. and control of stop position, constant tray speed, deceleration, etc.

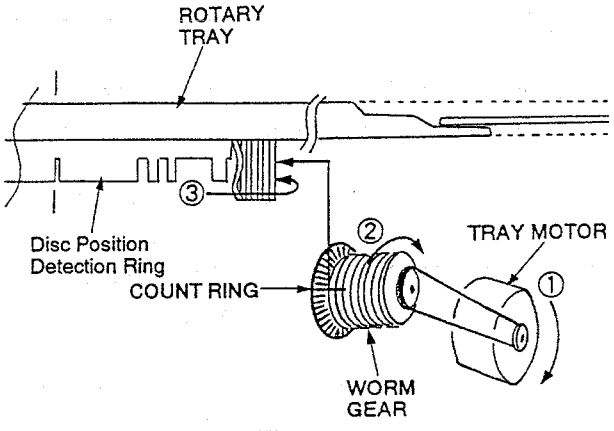



Fig. 45

## CHECKPOINTS ON FAILURE OF MECHANISM ACTION

| Symptoms | Checkpoints |
|---|---|
| 1 When the power switch is set to ON, the tray base opens and the Rotary tray stops (with the tray base open as it is) after about 1/5 turn. | Eigher the Up side switch or DOWN side switch of S551 is left in the ON position. |
| 2 When the power switch is set to ON, the rotary tray rotation indicator (see Fig. 46) keeps indicating rotation, and the tray base is not caused to open by pressing the OPEN/CLOSE | The DOWN side switch of S551 is left in the OFF position. |
| 3 When the power switch is set to ON and the OPEN/CLOSE key is pressed, the tray fails to open. | 1. D501 is defective if the rotary tray repeats turning left and right at intervals of about 1 second.<br>2. D502 is defective if the rotary tray repeats turning left and right at intervals of about 5 second. |
| 4 Power ON is normal. But when the PLAY key is pressed, the tray base opens and repeats opening and closing. | The UP side switch of S551 is left in the OFF position. |
| 5 Power ON and Play function are normal. But when the OPEN/CLOSE key is pressed, the sec. (time) indicator on the FL display flickers instantaneously only and the tray fails to open. | S552 is left in the ON position. |
| 6 Power ON and Play function are normal. But when the OPEN/CLOSE key is pressed, the tray opens and about 5 seconds later it closes unexpectedly. | S552 is left in the OFF position. |
| 7 When the DISC SKIP key is pressed, the disc marks do not disappear through no disc is in. | D503 is defective. |
| 8 When the DISC SKIP key is pressed, the disc marks all disappear though the disc is in. | D503 is defective. |

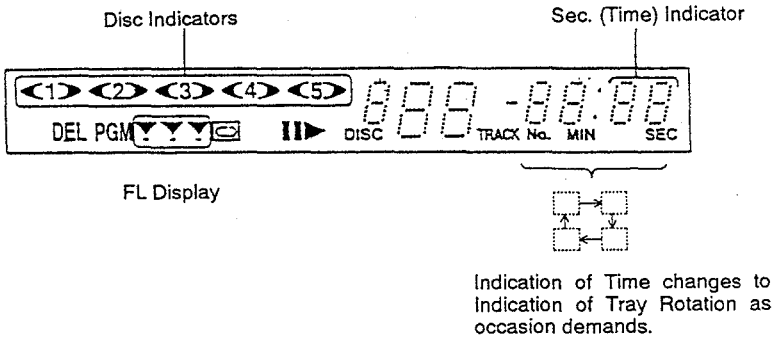

Disc Indicators
Sec. (Time) Indicator
1
2
3
4
5
DEL PGM
DISC
TRACK No.
MIN
SEC
FL Display
Indication of Time changes to Indication of Tray Rotation as occasion demands.

Fig. 46

ORDER NO. AD9304104C8

# Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

MASH* multi-stage noise shaping

Compact Disc Changer

# SL-PD647

**Colour**

(K) ... Black Type

**Area**

| Suffix for Model No. | Area | Colour |
|---|---|---|
| (E) | Europe. | (K) |
| (GC) | Asia, Latin America, Middle Near East and Africa. | |
| (GN) | Oceania. | |

※
- Technics (or Panasonic) developed the world's first MASH type DAC and ADC. MASH technology was invented by NTT (LSI Labs).
- MASH is a trademark of NTT.

## NEW MECHANISM SERIES
## (RAE0301: Type A/RAE0302: Type B)

## SPECIFICATIONS

**■ Audio**

| | |
|---|---|
| **No. of channels** | 2 (left and right, stereo) |
| **Frequency response** | 2–20,000 Hz, ±1 dB |
| **Output voltage** | 2 V (at 0 dB) |
| **Dynamic range** | 92 dB |
| **S/N** | 100 dB |
| **Total harmonic distortion** | 0.007% (1 kHz, 0 dB) |
| **Wow and flutter** | Below measurable limit |
| **DA converter** | MASH (1 bit) |
| **Output impedance** | Approx. 1 kΩ |
| **Load impedance** | More than 10 kΩ |

**■ Pickup**

| | |
|---|---|
| **Wavelength** | 780 nm |

**■ General**

| | |
|---|---|
| **Power consumption** | 15 W |
| **Power supply** | |
| **For (E, GN) areas.:** | AC 50/60 Hz, 230–240 V |
| **For (GC) area:** | AC 50/60 Hz, 110 V/127 V/220 V/240 V |
| **Dimensions (W × H × D)** | 430 × 130 × 401 mm |
| **Weight** | 5.0 kg |

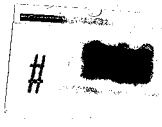
**Note:**

Design and specifications are subject to change without notice.
Weight and dimensions are approximate.

## ■ CONTENTS


| | Page |
|---|---|
| PRECAUTION OF LASER DIODE | 2 |
| ACCESSORIES | 3 |
| CONNECTIONS | 3 |
| FRONT PANEL CONTROLS AND FUNCTIONS | 4, 5 |
| BEFORE MOVING | 6 |
| HANDLING PRECAUTIONS FOR OPTICAL PICKUP | 7 |
| INSTRUCTIONS FOR TRAVERSE OIL | 7 |
| DISASSEMBLY INSTRUCTIONS | 8~15 |
| HOW TO CHECK THE MAIN AND SERVO P.C.B. | 16, 17 |
| OPERATING THE UNIT WITHOUT THE FRONT PANEL ASS'Y (OPERATING P.C.B. AND KEYS) | 18 |
| DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS (SELF-CHECK FUNCTION) | 19, 20 |
| NEW DIGITAL SERVO CIRCUIT | 20 |
| NEW DIGITAL SERVO SYSTEM | 21, 22 |
| TROUBLESHOOTING GUIDE | 23, 24 |
| MEASUREMENTS AND ADJUSTMENTS | 25, 26 |
| TERMINAL FUNCTION OF IC'S | 27~30 |
| BLOCK DIAGRAM | 31~33 |
| SCHEMATIC DIAGRAM | 34~39 |
| PRINTED CIRCUIT BOARDS | 40~43 |
| WIRING CONNECTION DIAGRAM | 44 |
| INTERNAL CONNECTION OF FL | 45 |
| REPLACEMENT PARTS LIST | 46~48 |
| PACKAGING | 47 |
| EXPLODED VIEWS | 49~52 |
| RESISTORS AND CAPACITORS | 53 |


Technics



# ■ PRECAUTION OF LASER DIODE

**CAUTION:** This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 780nm
Maximum output radiation power from pickup: 100μW/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

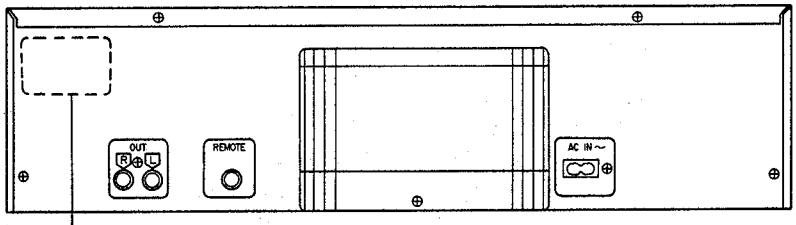
**ACHTUNG:** Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale Strahlungsleistung der Lasereinheit: 100μW/VDE

Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.

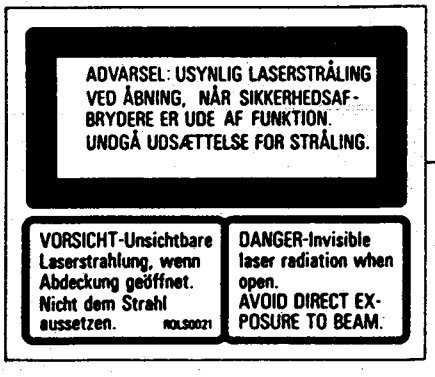
**ADVARSEL: I dette a apparat anvendes laser.**

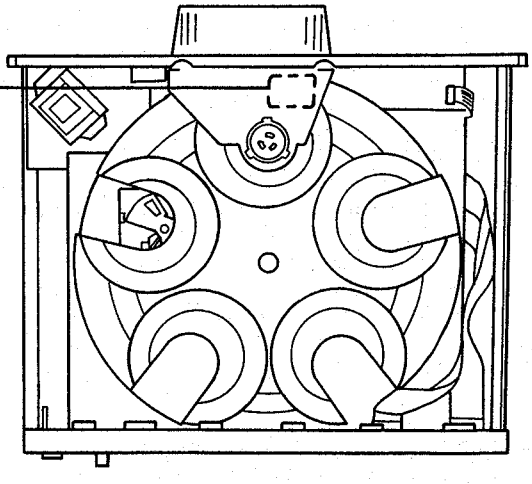



SQWD7

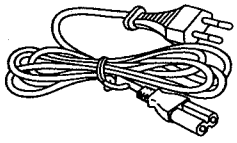
**LUOKAN 1 LASERLAITE**
**KLASS 1 LASER APPARAT**

RQLS0021

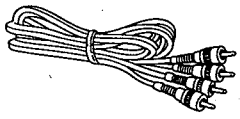

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT-Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet. Nicht dem Strahl aussetzen.
RQLS0021
DANGER-Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.



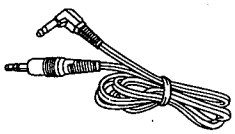
## ■ ACCESSORIES (included)



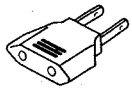
AC power supply cord..... 1 pc.
[ RJA0019-2K (E, GC)
SJA173 (GN) ]



Stereo connection cable..... 1 pc.
(SJP2249-3)



Remote control cable..... 1 pc.
(SJP2257T)



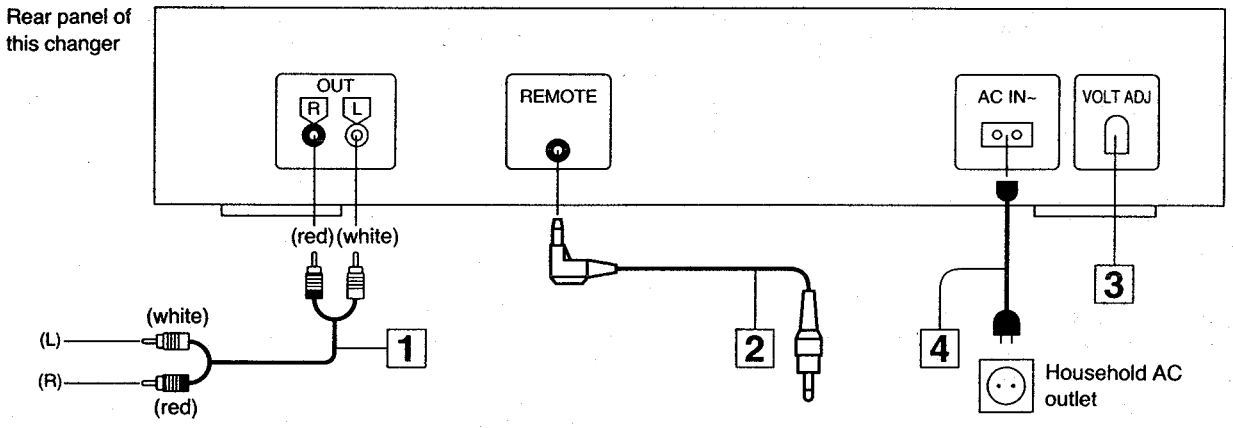
Power plug adaptor... 1 pc.
(SJP5213-2)
**For (GC) area.**

## ■ CONNECTIONS

Before connecting the changer to your audio system, be sure that the power of the changer and all other system components are turned off.

**Note:**

The configuration of the AC outlet and AC power supply cord differs according to area.




**1 Connect the stereo connection cable (included) to CD or AUX terminals of the amplifier or the receiver.**

**2 To operate with the remote control, connect the remote control cable (included) to the REMOTE CONTROL OUT terminal of Technics component.**

> The operations such as play, stop, skip etc. can be operated by remote control included with Technics receiver or the component system. For details, refer to the operating instructions of the receiver or the system to be used.

**For (GC) area.**

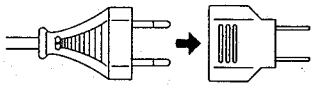
**3 Set the voltage selector (VOLT ADJ) to the voltage setting for the area in which the unit will be used.**

- Use a minus (−) screwdriver.
- Note that this unit will be seriously damaged if this setting is not made correctly.
- If the power supply in your area is 117 V or 120 V, set to the "127 V" position.

**4 Connect the power supply cord (included) to the household AC outlet or to AC OUTLET of Technics component.**

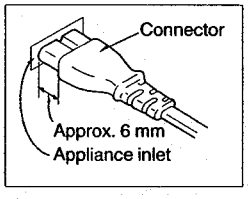
**For (GC) area.**

If the power plug will not fit your socket, use the power plug adaptor (included).

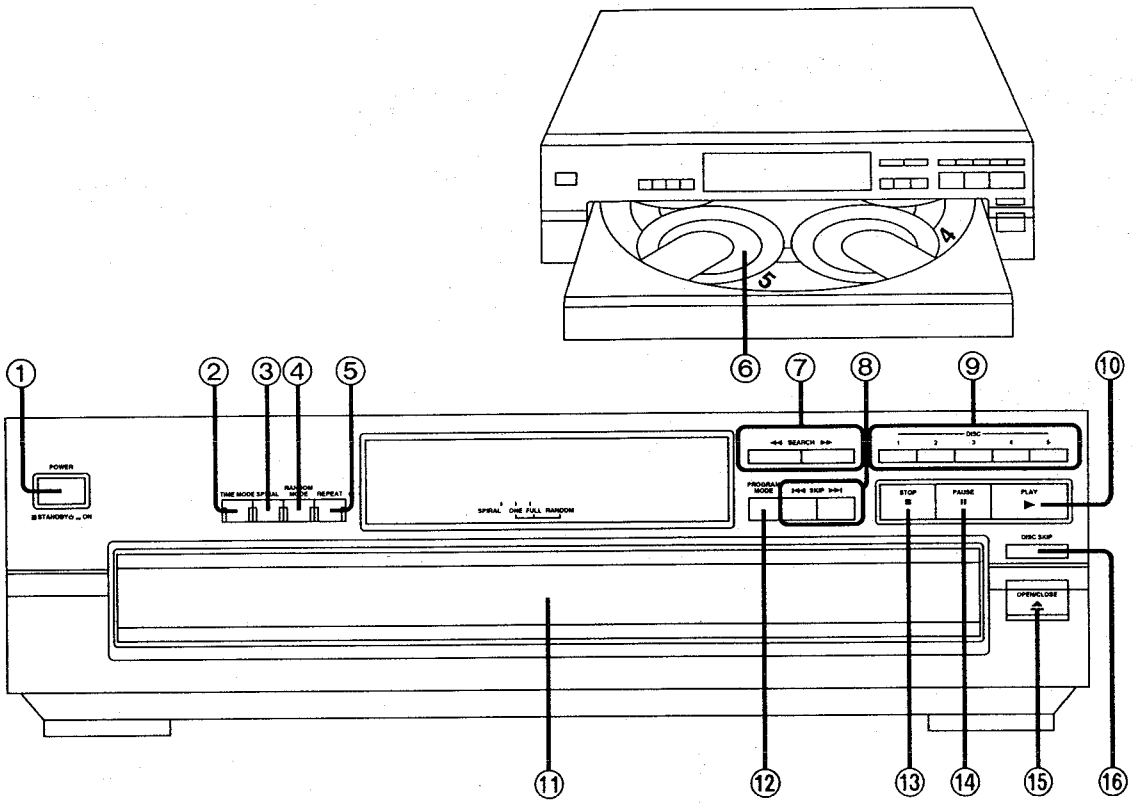


**Insertion of Connector**

Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing.
However there is no problem using the unit.



# ■ FRONT PANEL CONTROLS AND FUNCTIONS




## Control section

### ① Power "STANDBY ⏻ /ON" switch (POWER, ▙ STANDBY ⏻ ▂ ON)
Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.

### ② Time mode select button (TIME MODE)
Use to select the desired time mode. Each time you press the button, the display information will change as follows.
1. Track number and its elapsed play time of the current track.
2. Total remaining time on the disc.
3. Track number and remaining time of the current track.
4. Total elapsed play time on the disc.

### ③ Spiral button (SPIRAL)
Press to play the first tracks on all the loaded discs in sequence, followed by the second tracks on all the discs, and so on.

### ④ Random mode button (RANDOM MODE)
The mode changes as follows each time the button is pressed.

↱ Sequential → One disc random → Full random ↰

### ⑤ Repeat button (REPEAT)
Press to repeat tracks.

### ⑥ Disc trays (1–5)
You can load up to five discs, one disc per one tray.

### ⑦ Search buttons (◀◀ SEARCH ▶▶)
Press to move forward or backward through the tracks on the disc.

### ⑧ Skip buttons (I◀◀SKIP▶▶I)
Use to skip to the beginning of the track.

### ⑨ Disc buttons (DISC 1–5)
Use to select desired disc.

### ⑩ Play button (▶ PLAY)

### ⑪ Loading drawer
You can load and unload discs when this drawer is open.

### ⑫ Program mode button (PROGRAM MODE)
The mode changes as follows each time the button is pressed.

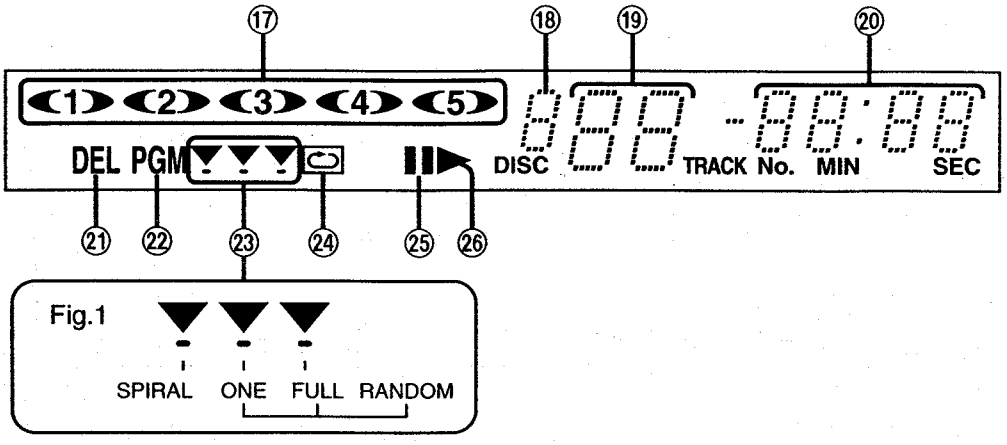
↱ Sequential → Program → Delete ↰

### ⑬ Stop button (■ STOP)

### ⑭ Pause button (❚❚ PAUSE)

### ⑮ Loading drawer open/close button (▲ OPEN/CLOSE)

### ⑯ Disc skip button (DISC SKIP)
Use to rotate the disc tray.




## Display section

### ⑰ Disc indicators ( 1 ~ 5 )
The indicator corresponding to the playing disc flashes.
In the program play mode, programmed disc indicators will illuminate. In the delete play mode, disc indicators to be deleted will go out.

### ⑱ Disc number display
Shows the number (1–5) of disc.

### ⑲ Track number display
Shows the number (up to 99) of track.

### ⑳ Time/program sequence display
Shows the elapsed playing time of the track in play.
Also shows the program sequence in the program play mode, and the sequence you entered in the delete play mode.

### ㉑ Delete play indicator (DEL)
Lights in the delete play mode.

### ㉒ Program play indicator (PGM)
Lights in the program play mode.

### ㉓ Play mode indicators ( ▼▼▼ ) (Fig. 1)
Each indicator points to the following play modes:
SPIRAL: Spiral play
ONE: One disc random play
FULL: Full random play

### ㉔ Repeat indicator ( ⟲ )
Lights when the repeat function is activated.

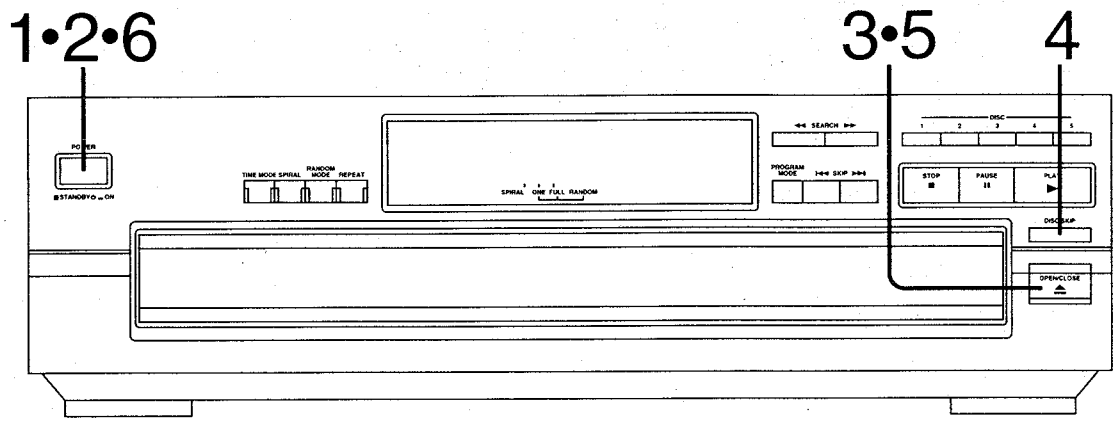
### ㉕ Pause indicator (❚❚)
Lights in the pause mode.

### ㉖ Play indicator (▶)
Lights in the play mode.

# ■ BEFORE MOVING

**CAUTION:**

Before moving this changer to another location, be sure that no discs were left in the changer and that the power was not switched to the standby condition while in the play mode.
Failure to do so will expose the compact discs and the changer to the risk of severe damage.




1 **Press POWER to switch to the standby condition.**

2 **Press POWER to switch on the power.**

3 **Press OPEN/CLOSE to open the loading drawer.**

4 **Press DISC SKIP to rotate the disc trays and remove the discs from all disc trays.**

5 **Press OPEN/CLOSE to close the loading drawer.**

6 **Press POWER to switch to the standby condition.**

If you have pressed a wrong button by mistake, return to step 1.

The optical pickup will be automatically released when using the changer again.

# ■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

### • Handling of optical pickup

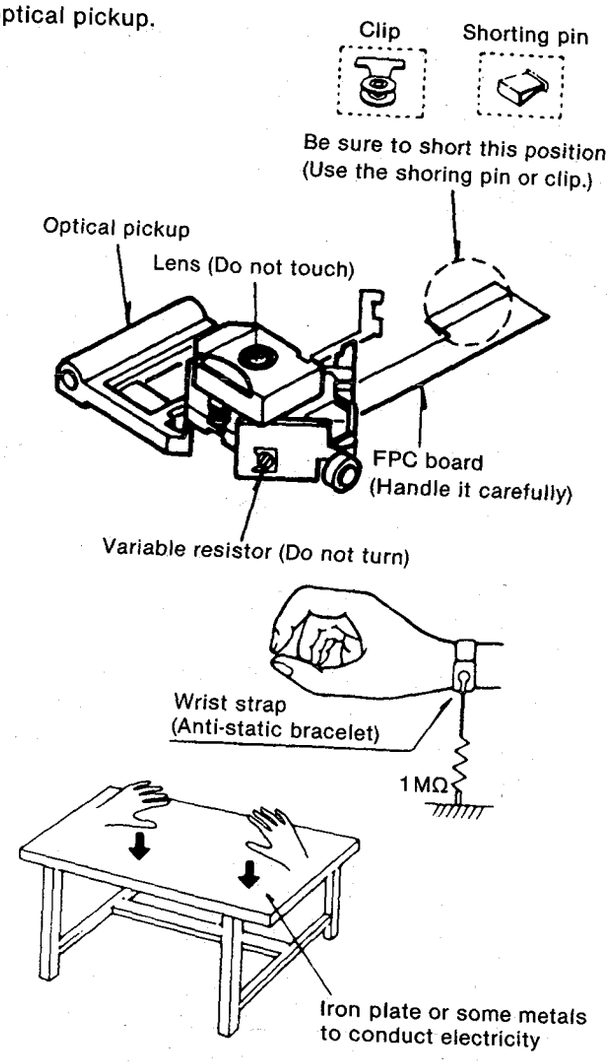
1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board).
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

### • Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table gounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

**Caution:**

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

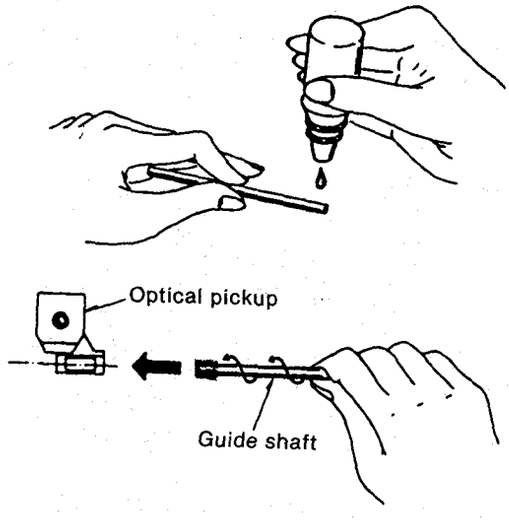



# ■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZ0L31)

The container contains 6g (approx. 3ml) of oil.
One application (one shaft) uses 0.05ml of oil.

### How to Use

(1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
(2) Apply one drop of the SZZ0L31 to the tip of the guide shaft.
(3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
(4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.

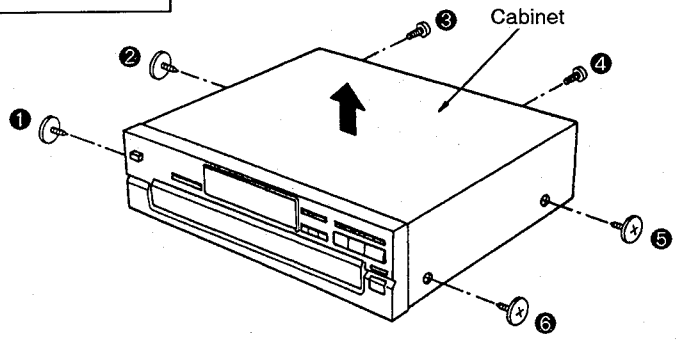


# ■ DISASSEMBLY INSTRUCTIONS

**Warning:** This product uses a laser diode. Refer to caution statements on page 2.

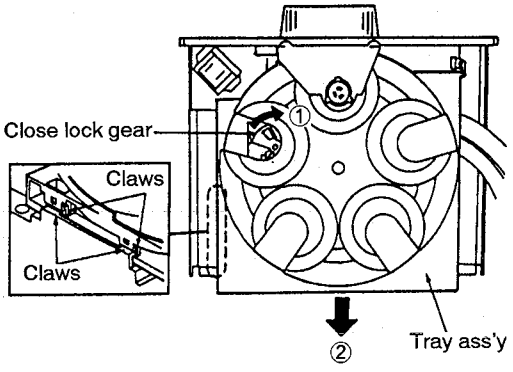
**ACHTUNG:** • Die lasereinheit nicht zerlegen.
• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

| Ref.No. 1 | Removal of the cabinet |
|---|---|
| Procedure 1 | |

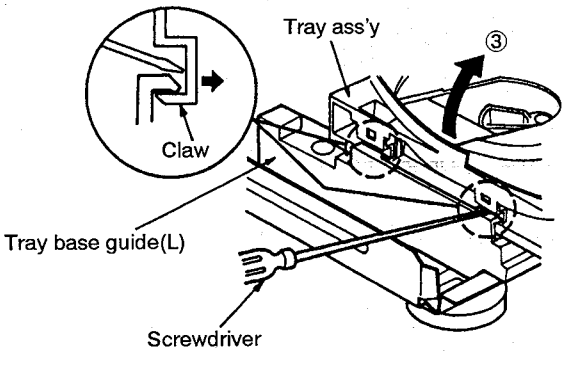



1. Remove the 6 screws(❶~❻).
2. Remove the cabinet in the direction of arrow.

| Ref.No. 3 | Removal of the tray ass'y |
|---|---|
| Procedure 1→2→3 | **Note:** Be sure the close position to remove the tray ass'y. |

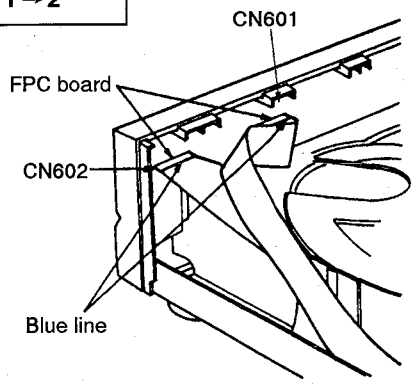



1. Keep the close lock gear pressed in the direction of arrow ① and move the tray ass'y in the direction of arrow ②.
2. Fit the claws of the tray ass'y in the claws of the tray base guide (L).



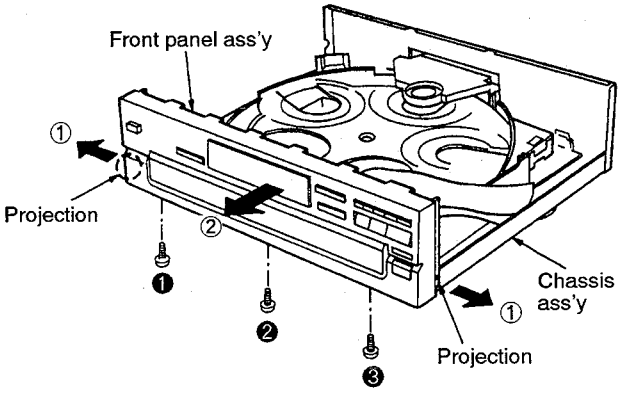

3. Remove the tray ass'y in the direction of arrow ③ by pressing the claw of the tray ass'y with a screw driver or another suitable object.

| Ref.No. 2 | Removal of the front panel ass'y |
|---|---|
| Procedure 1→2 | |

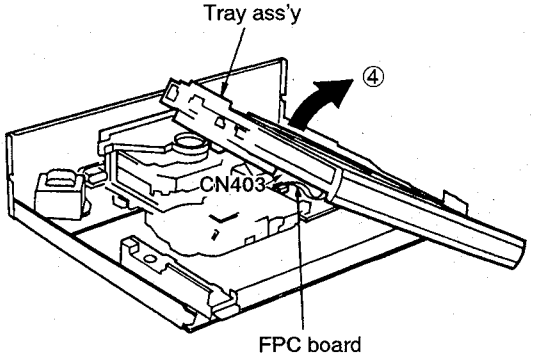



■ **Note on installation**
Connect the FPC board with the blue line upward.

1. Pull out the FPC board.



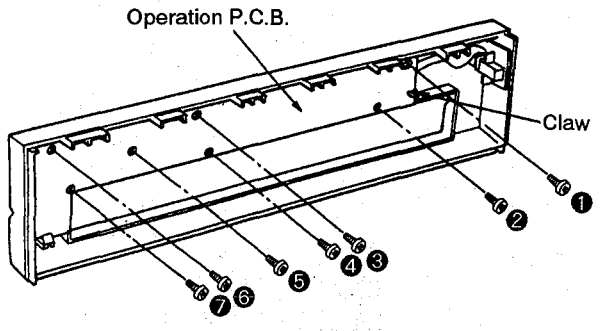

2. Remove the 3 screws(❶~❸).
3. Pull the front panel ass'y in both directions of arrow ① to unlock it from the projection of the chassis ass'y.
4. Remove the front panel ass'y in the direction of arrow ②.




4. Raise the left side of the tray ass'y in the direction of arrow ④ and remove the claw on the right side.
5. Pull out the FPC board.

| Ref.No. 4 | Removal of the operation P.C.B. |
|---|---|

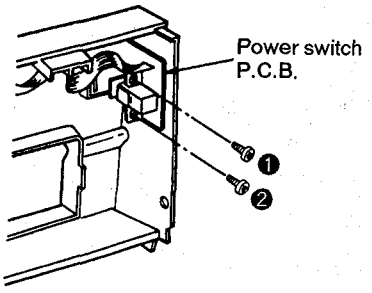
**Procedure 1→2→4**




1. Remove the 7 screws(❶~❼).
2. Release the 1 claw.

| Ref.No. 5 | Removal of the power switch P.C.B. |
|---|---|

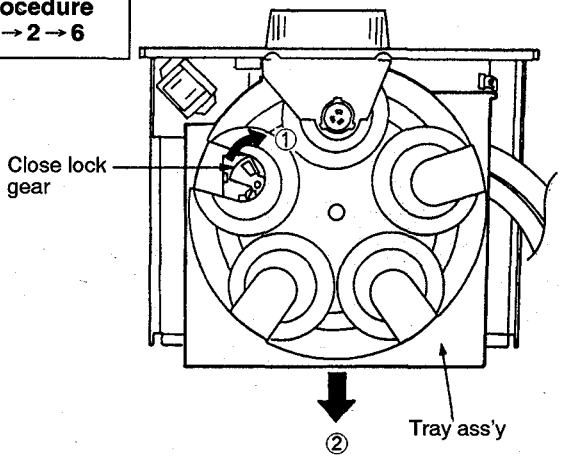
**Procedure 1→2→5**



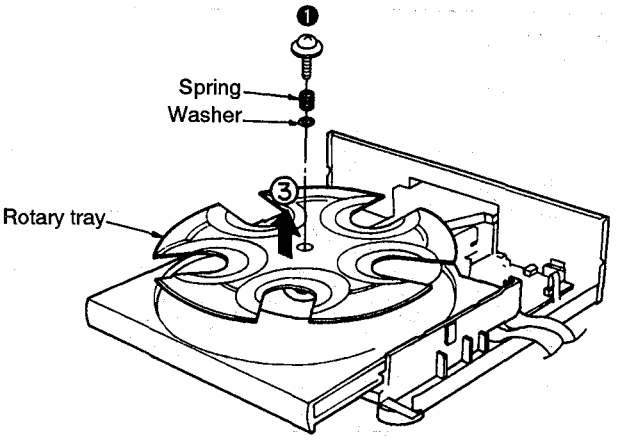

• Remove the 2 screws(❶, ❷).

| Ref.No. 6 | Removal of the rotary tray |
|---|---|

**Procedure 1→2→6**



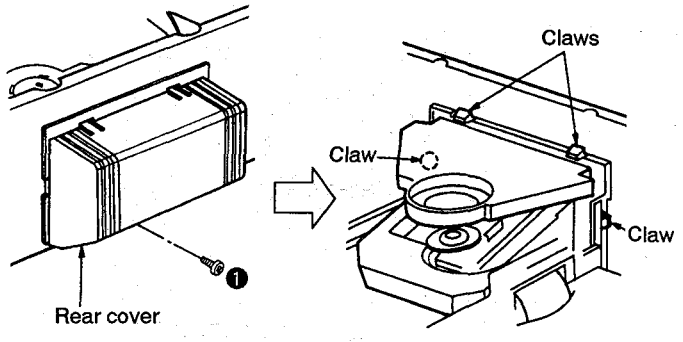

1. Keep the close lock gear pressed in the direction of arrow ① and move the tray ass'y in the direction of arrow ②.




2. Remove the 1 screw(❶).
3. Remove the spring and washer.
4. Remove the rotary tray in the direction of arrow ③.

| Ref.No. 7 | Removal of the rear cover |
|---|---|

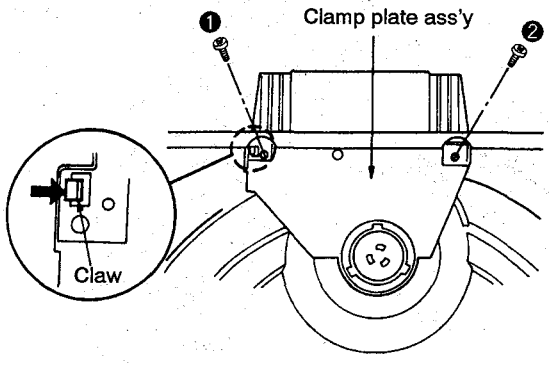
**Procedure 1→7**




1. Remove the 1 screw(❶).
2. Release the 4 claws.

| Ref.No. 8 | Removal of the clamp plate ass'y |
|---|---|

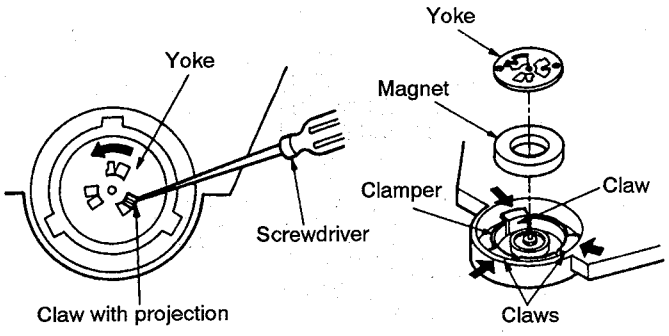
**Procedure 1→8**




1. Remove the 2 screws(❶, ❷).
2. Release the 1 claw.

| Ref.No. 9 | Removal of the clamper ass'y (yoke, magnet and clamper) |
|---|---|

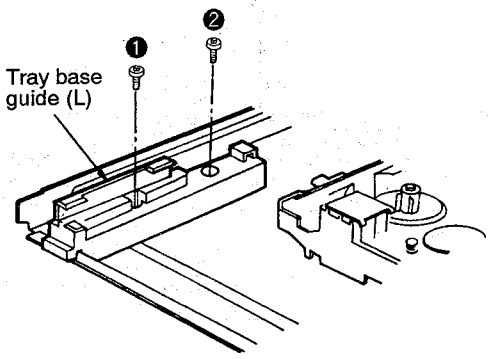
**Procedure** 1→8→9




1. While lifting the claw with a screwdriver, rotate yoke in the direction of arrow and remove the yoke and magnet.
2. Release the 3 claws of the clamper.

| Ref.No. 11 | Removal of the tray base guide (L) |
|---|---|

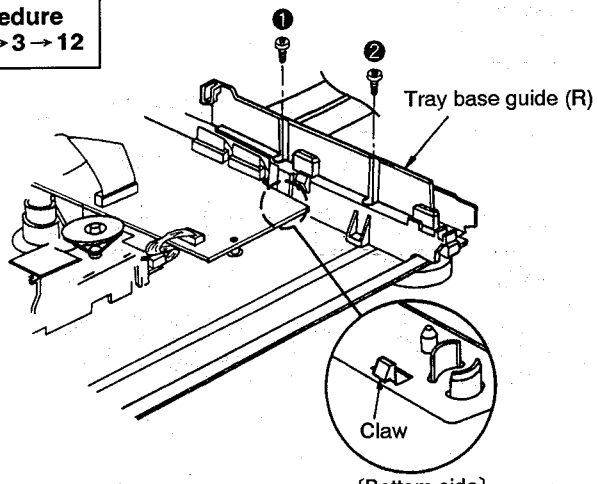
**Procedure** 1→2→3→11




• Remove the 2 screws(❶, ❷).

| Ref.No. 12 | Removal of the tray base guide (R) |
|---|---|

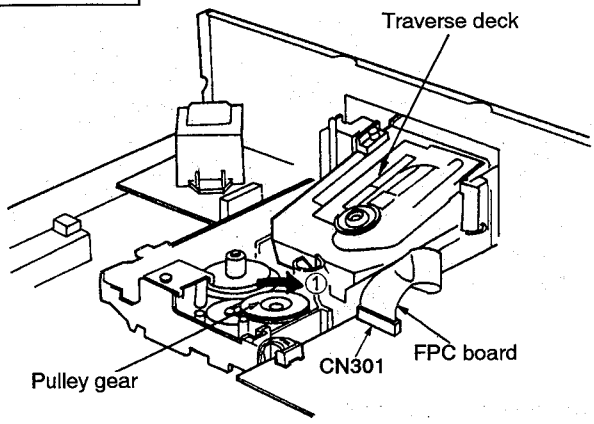
**Procedure** 1→2→3→12



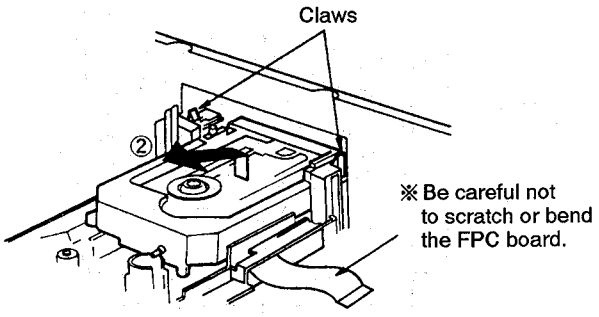

1. Remove the 2 screws(❶, ❷).
2. Release the 1 claw.

| Ref.No. 10 | Removal of the traverse deck |
|---|---|

**Procedure** 1→2→3→7→8→10



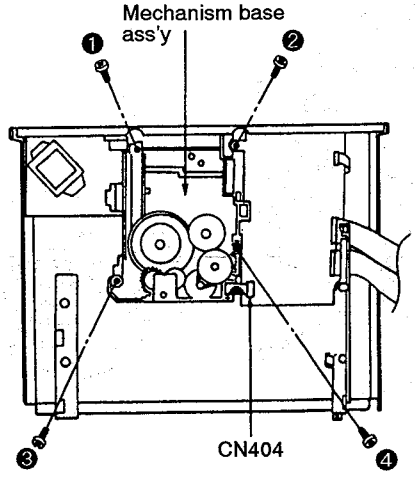

1. Rotate the pulley gear in the direction of arrow ① until the traverse deck comes up.
2. Pull out the FPC board (CN301).




3. Release the 2 claws.
4. Remove the traverse deck in the direction of arrow ②.

| Ref.No. 13 | Removal of the mechanism base ass'y |
|---|---|

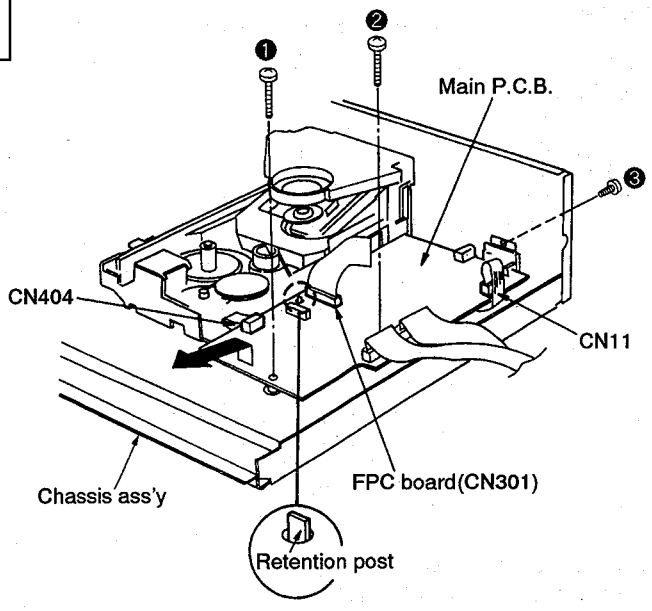
**Procedure** 1→2→3→7→8→10→13



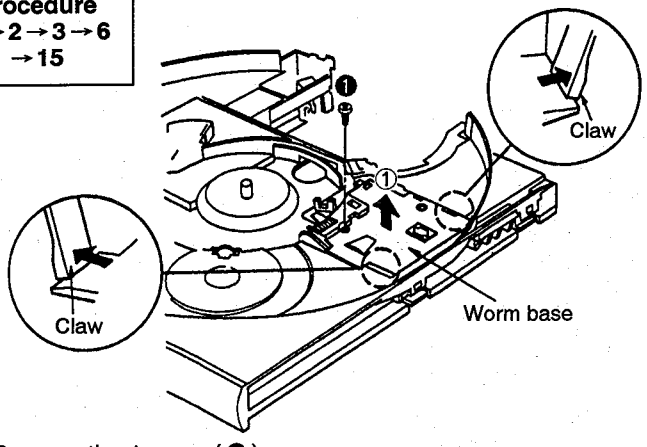

1. Remove the 1 flat cable(CN404).
2. Remove the 4 screws(❶~❹).

| Ref.No. 14 | Removal of the main P.C.B. |
|---|---|
| Procedure 1→2→3→12→14 | |

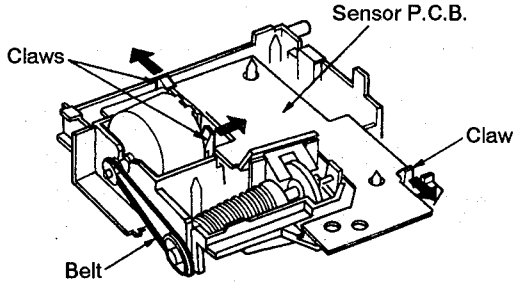
1. Remove the 3 screws(❶~❸).
2. Lift the main P.C.B. off the retention post on the chassis ass'y.
3. Remove the 2 flat cable(CN11, CN404).
4. Pull out the FPC board(CN301).
5. Remove the main P.C.B. in the direction of arrow.




| Ref.No. 15 | Removal of the worm base and sensor P.C.B. |
|---|---|
| Procedure 1→2→3→6→15 | |

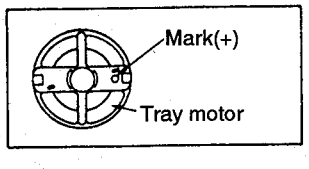


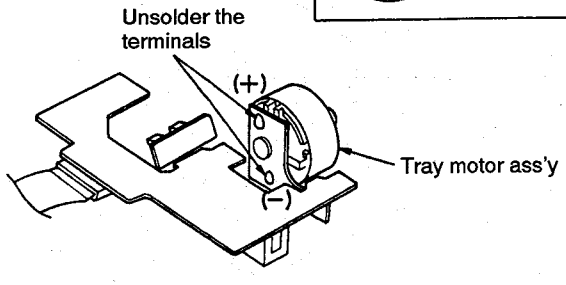

1. Remove the 1 screw(❶).
2. Release the 2 claws and then remove the worm base in the direction of arrow①.




3. Remove the belt.
4. Release the 3 claws.

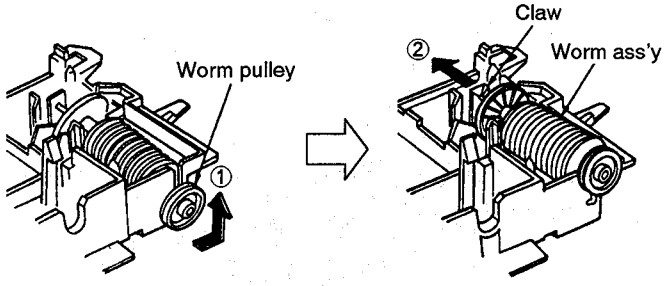
| Ref.No. 16 | Removal of the tray motor ass'y |
|---|---|
| Procedure 1→2→3→6→15→16 | |




• Unsolder the terminals of the tray motor ass'y.

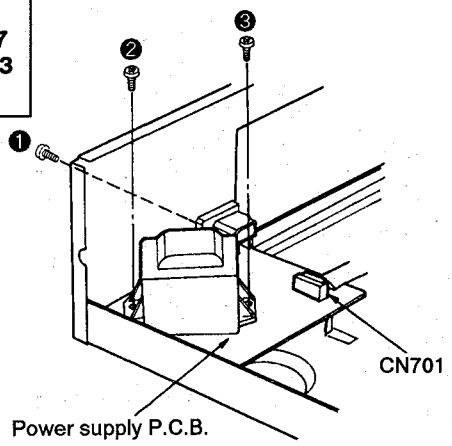
| Ref.No. 17 | Removal of the worm ass'y |
|---|---|
| Procedure 1→2→3→6→15→17 | |




1. Raise the worm pulley in the direction of arrow①.
2. Remove the worm ass'y by pressing the claw in the direction of arrow②.

| Ref.No. 18 | Removal of the power supply P.C.B. |
|---|---|

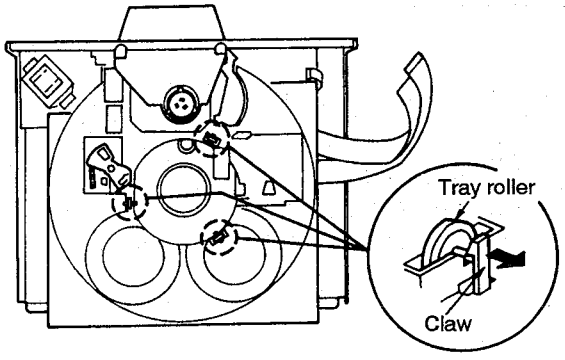
**Procedure**
1 → 2 → 3 → 7 → 8 → 10 → 13 → 18




1. Remove the 1 flat cable(CN701).
2. Remove the 3 screws(❶~❸).

| Ref.No. 19 | Removal of the tray roller |
|---|---|

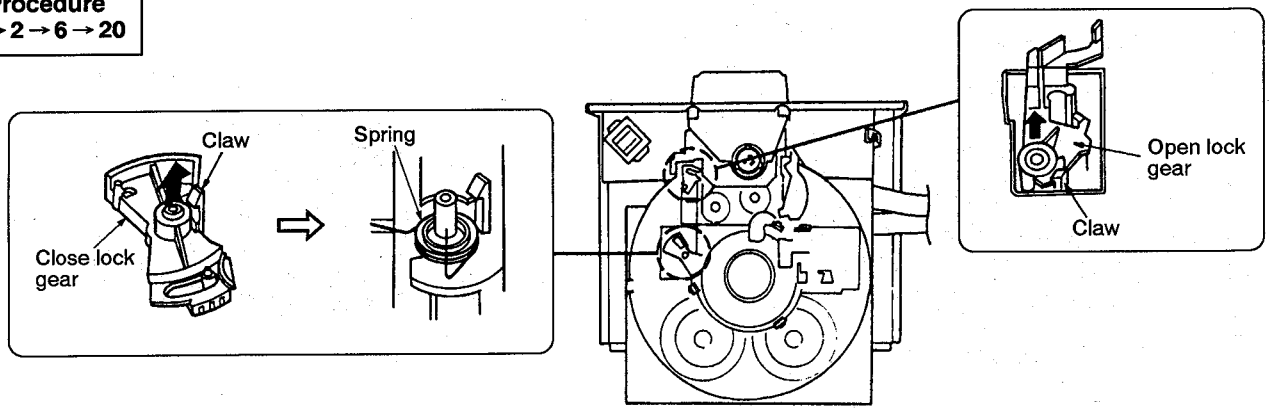
**Procedure**
1 → 2 → 6 → 19




- Release the claw in the direction of arrow.

| Ref.No. 20 | Removal of the close lock gear and open lock gear |
|---|---|

**Procedure**
1 → 2 → 6 → 20

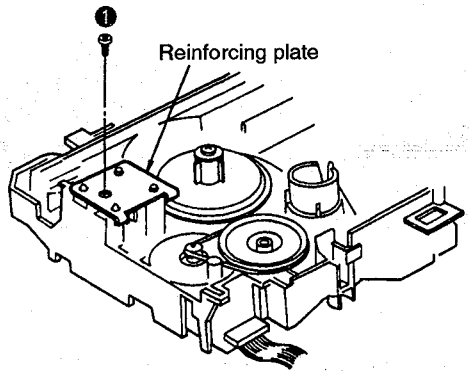



**■ Close lock gear**
1. Release the claw and then remove the close lock gear in the direction of arrow.
2. Remove the spring.

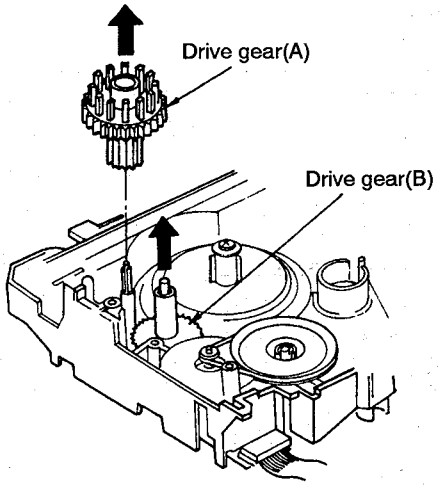
**■ Open lock gear**
- Release the claw and then remove the open lock gear in the direction of arrow.

| Ref.No. 21 | Removal of the drive gear(A) and drive gear(B) |
|---|---|

**Procedure**
1 → 2 → 3 → 21



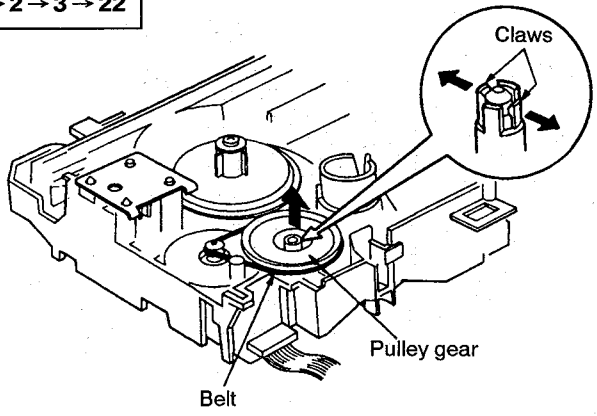

1. Remove the 1 screw(❶).
2. Remove the reinforcing plate.




3. Remove the drive gear(A) and drive gear(B).

| Ref.No. 22 | Removal of the pulley gear |
|---|---|

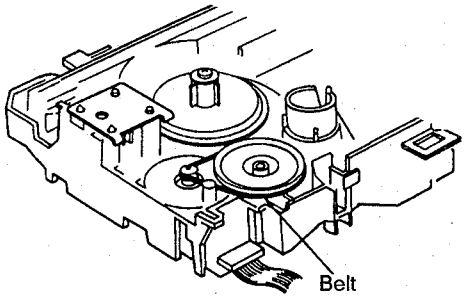
**Procedure**
**1 → 2 → 3 → 22**



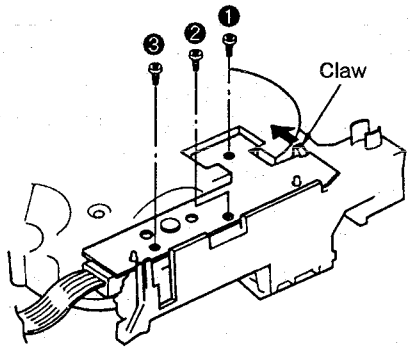

1. Remove the belt.
2. Release the 2 claws and then remove the pulley gear in the direction of arrow.

| Ref.No. 24 | Removal of the loading motor P.C.B. |
|---|---|

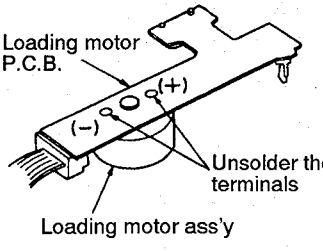
**Procedure**
**1 → 2 → 3 → 7 → 8 → 10 → 13 → 24**

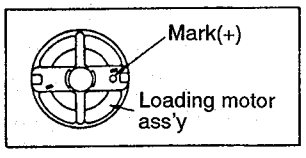



1. Remove the belt.




2. Remove the 3 screws(❶ ~ ❸).
3. Release the 1 claw.

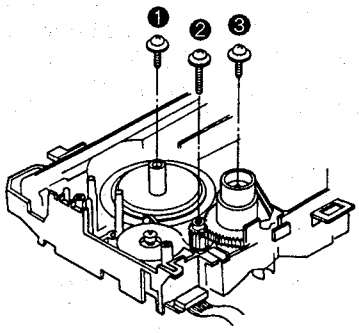


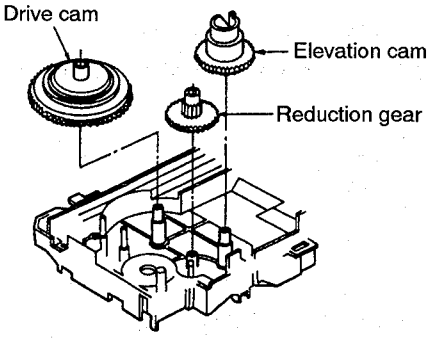

4. Unsolder the terminals of the loading motor ass'y.

| Ref.No. 23 | Removal of the drive cam, elevation cam and reduction gear |
|---|---|

**Procedure**
**1 → 2 → 3 → 21 → 22 → 23**




1. Remove the 3 screws(❶ ~ ❸).

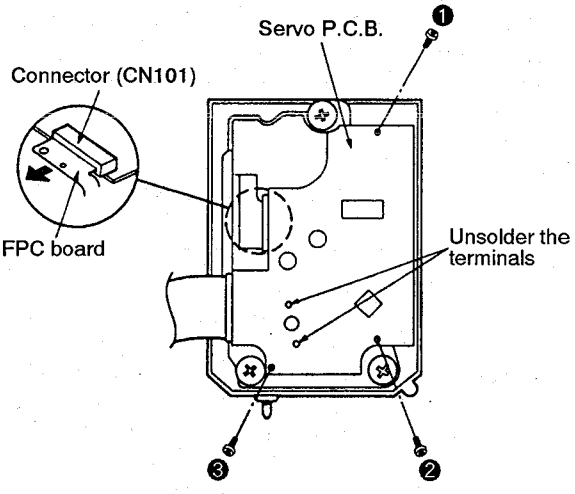



2. Remove the drive cam, elevation cam and reduction gear.

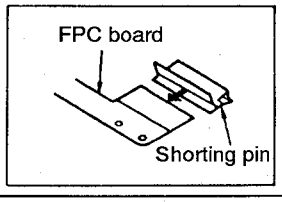
| Ref.No. 25 | Removal of the servo P.C.B. |
|---|---|

**Procedure**
**1 → 2 → 3 → 7 → 8 → 10 → 25**

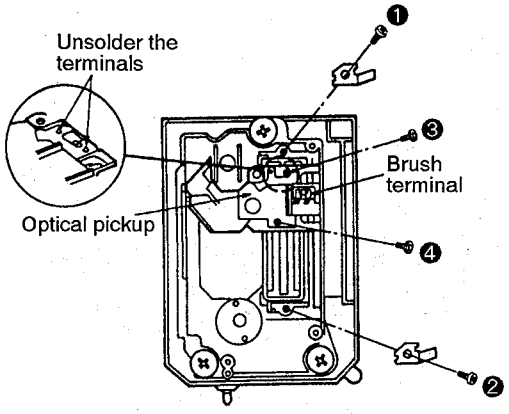
1. Remove the 3 screws(❶ ~ ❸).
2. Unsolder the 2 terminals of spindle motor.
3. Remove the FPC board from the optical pickup.




**Caution:** To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board.



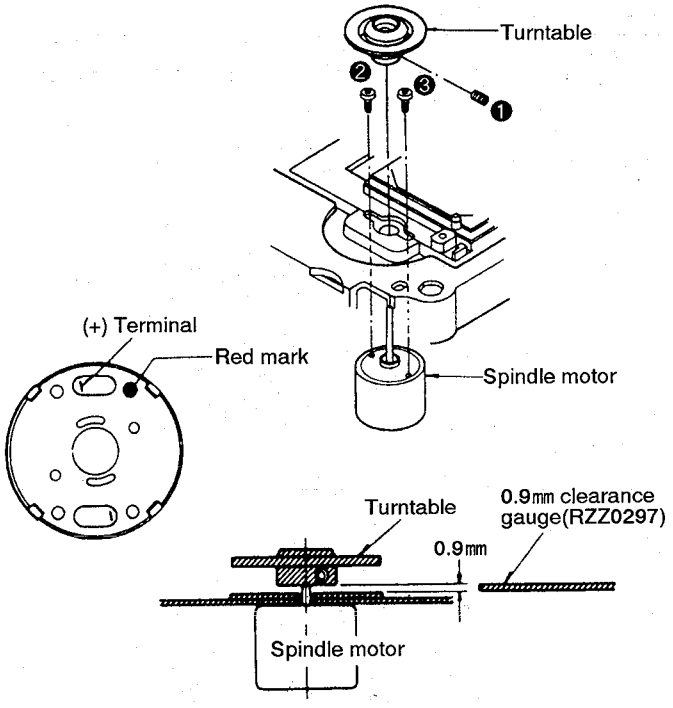
| Ref.No. 26 | Removal of the optical pickup |
|---|---|
| Procedure 1→2→3→7 →8→10→25 →26 | Refer to handling precautions for optical pickup and instructions for traverse oil (See page 7). |




1. Remove the 2 screws(❶, ❷).
2. Unsolder the 2 terminals and the 2 screws(❸, ❹).

**Caution:** Take care not to touch the brush terminal.

| Ref.No. 27 | Removal of the spindle motor |
|---|---|
| Procedure 1→2→3→7 →8→10→25 →27 | |



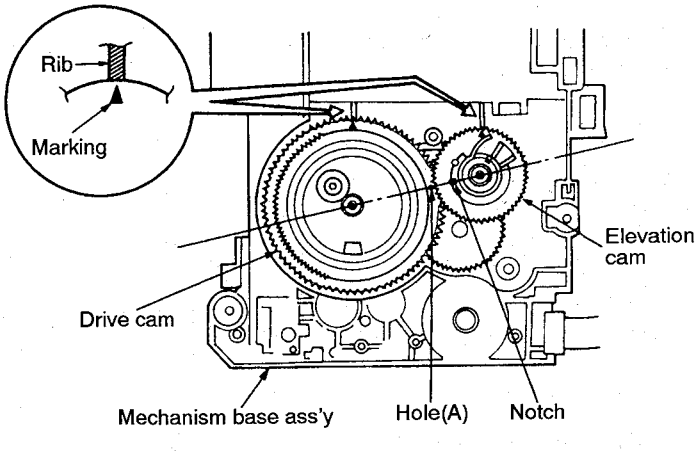

1. Loosen the 1 screw(❶) by using a 1.27mm allen wrench and remove the turntable.
2. Remove the 2 screws(❷, ❸).

**Caution:**
1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced.
2. The (+)terminal of the spindle motor is indicated by the red mark.

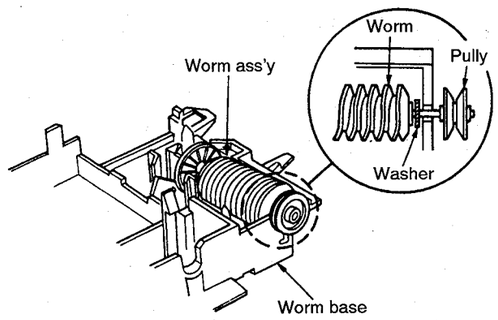
**Adjustment of turntable height**
1. Insert a 0.9mm clearance gauge (RZZ0297) between the turntable and loading base as shown in the figure.
2. Tighten the turntable set-screw by using a 1.27mm allen wrench.

**Caution:**
Refer to turntable height adjustment (See page 25).

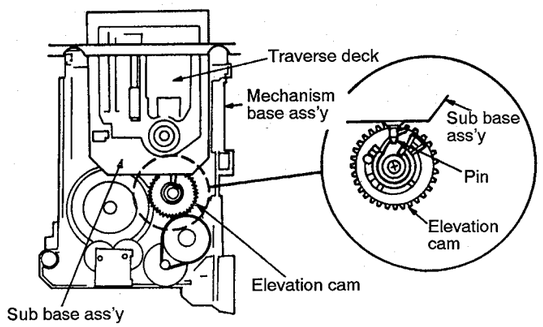
- **Installation of the elevation cam and drive cam**
  1. Align the drive cam, the marking (▲) on the elevation cam, and the rib on the mechanism base ass'y.
  2. Check that hole(A) on the drive cam and the notch on the elevation cam are aligned in a straight line.



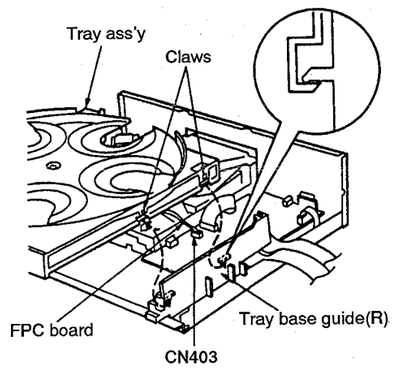
● **Installation of the worm ass'y**
When installing the worm ass'y onto the worm base, move the washer located between the worm and pulley next to the worm.




● **Installation of the traverse deck**
1. Position the elevation cam as shown in the figure on the right.
2. When the traverse deck is mounted on the mechanism base ass'y, check that the pin of the sub base ass'y is positioned at the slanted part of the rib on the elevation cam.

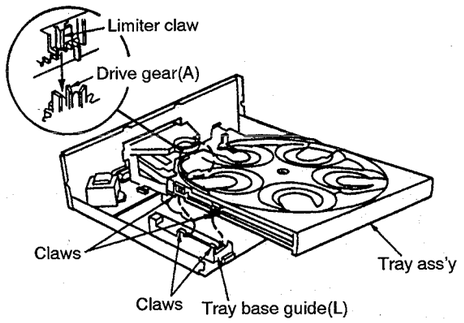


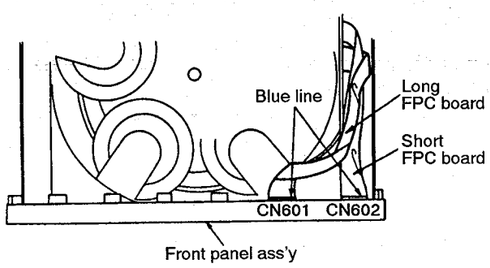

● **Installation of the tray ass'y**
1. Attach the FPC board to the connector(CN403).
2. Fit the claws on the right side of the tray ass'y underneath the claws on the tray base guide(R).




● **Notes on the installation of the FPC board for the front panel ass'y**
1. With its blue line facing up, fully insert the FPC board until the foil is no longer exposed.
2. Insert the short FPC board first and then insert the long FPC board over it.

3. Fit the limiter claw on the tray ass'y between the teeth of the drive gear(A).
4. Align the claws on the left side of the tray ass'y with the claws on the tray base guide(L) and push the tray ass'y until the claws catch.
5. After installing the tray ass'y, check that it moves smoothly.






# ■ HOW TO CHECK THE MAIN AND SERVO P.C.B.

● **Check the main P.C.B.**

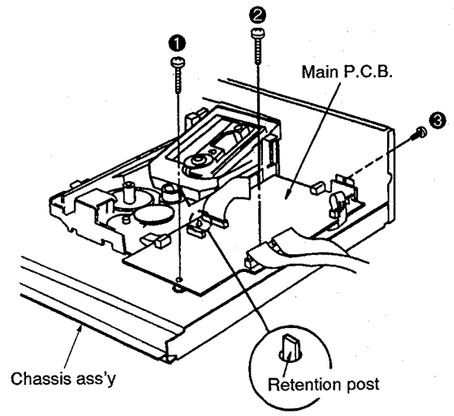



**Fig. 1**

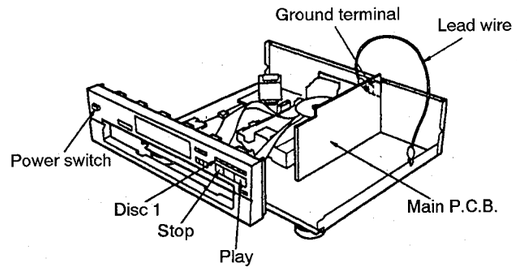



**Fig. 3**

● **Check the servo P.C.B.**
When checking the servo P.C.B., place the traverse deck sideways.
There are two ways(A) & (B) of securing the traverse deck as shown below.

**(A) Securing the traverse deck to the chassis ass'y.**

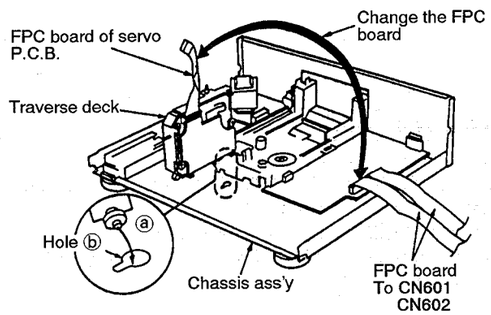



**Fig. 4**

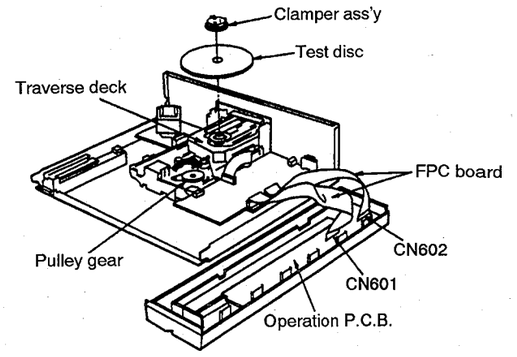



**Fig. 2**

1. Rotate the pulley gear in the direction of arrow until traverse deck comes up.
2. Place the test disc and secure it by using the clamper ass'y.
3. Connect the 2 FPC board(CN601, CN602) as shown in Fig. 2.
4. Remove the 3 screws(❶~❸) as shown in Fig. 1.
5. Lift the main P.C.B. off the retention post on the chassis ass'y.
6. Set up the main P.C.B.
7. Connect the main P.C.B. ground terminal (line out terminal) to the chassis ass'y with a lead wire.

**How to play the disc**

8. Set the unit in the test mode as follows:
(hold the play , stop and disc 1 keys(3 keys) on and set the power switch to ON.)
9. Press the play key and play the test disc.
10. When checking the soldered surface of the main P.C.B., do as shown in Fig. 3.

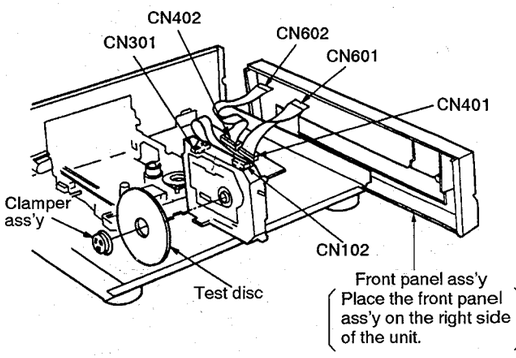



**Fig. 5**

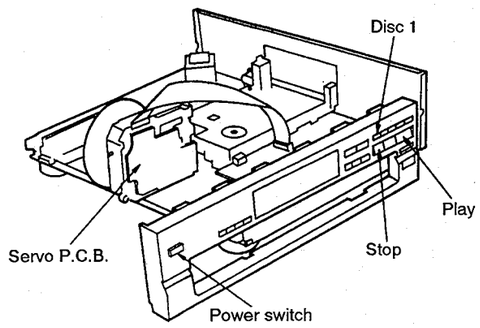



**Fig. 6**

1. Connect the FPC boards as shown in Fig. 5.
   (Between CN401 and CN601
   Between CN402 and CN602
   Between CN102 and CN301)
   Replace the FPC board for the servo P.C.B. (between CN102 and CN301) with the FPC board on the main P.C.B. (between CN401 and CN601 or between CN402 and CN602). (Reference the arrows in Fig. 4.)

**(B) Securing the traverse deck to the mechanism base ass'y.**

(The traverse deck cannot be secured unless the rear panel has been removed.)

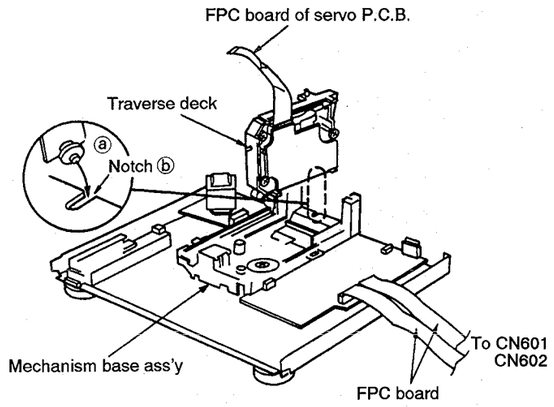



**Fig. 7**

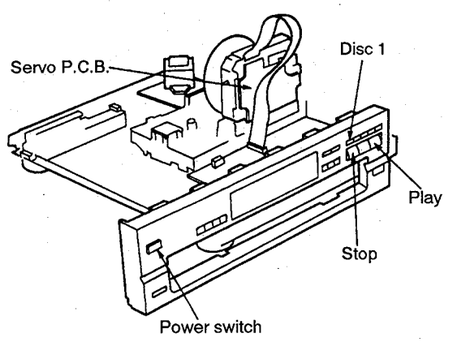



**Fig. 9**

**Notes:**
- The FPC board cannot be connected because it is too short when the traverse deck is secured sideways. Replace it with the long FPC board.
- After completing the check, restore the replaced FPC boards to their original positions.

2. Insert part ⓐ of the traverse deck into hole ⓑ of the chassis ass'y as shown in Fig. 4.

**How to play the disc**

3. Set the unit in the test mode as follows:
   (hold the play , stop and disc 1 keys(3 keys) on and set the power switch to ON.)
4. Press the play key and play the test disc.
5. When checking the soldered surface of the servo P.C.B., do as shown in Fig. 6.

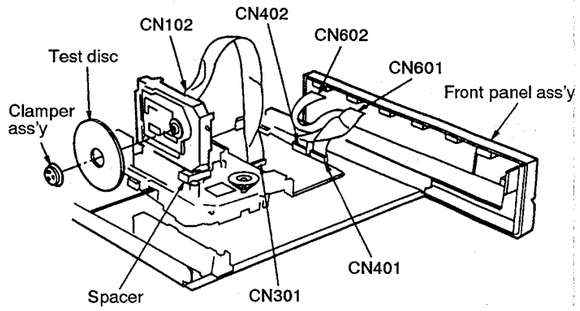



**Fig. 8**

1. Connect the FPC boards in the same manner as described in (A) above.
2. Insert part ⓐ of the traverse deck into notch ⓑ of the mechanism base ass'y as shown in Fig. 7.
3. Install the spacer so that the traverse deck is horizontal as shown in Fig. 8.

**How to play the disc**

4. Set the unit in the test mode as follows:
   (hold the play , stop and disc 1 keys(3 keys) on and set the power switch to ON.)
5. Press the play key and play the test disc.
6. When checking the soldered surface of the servo P.C.B., do as shown in Fig. 9.



## ■ OPERATING THE UNIT WITHOUT THE FRONT PANEL ASS'Y

### (OPERATING P.C.B. AND KEYS)

The main operations of the unit can be performed by shorting jumper wires on the main P.C.B. even if the FPC board from the control panel is not connected to the main P.C.B.

(When bent the jumper wire, pay attention not to cut it.)

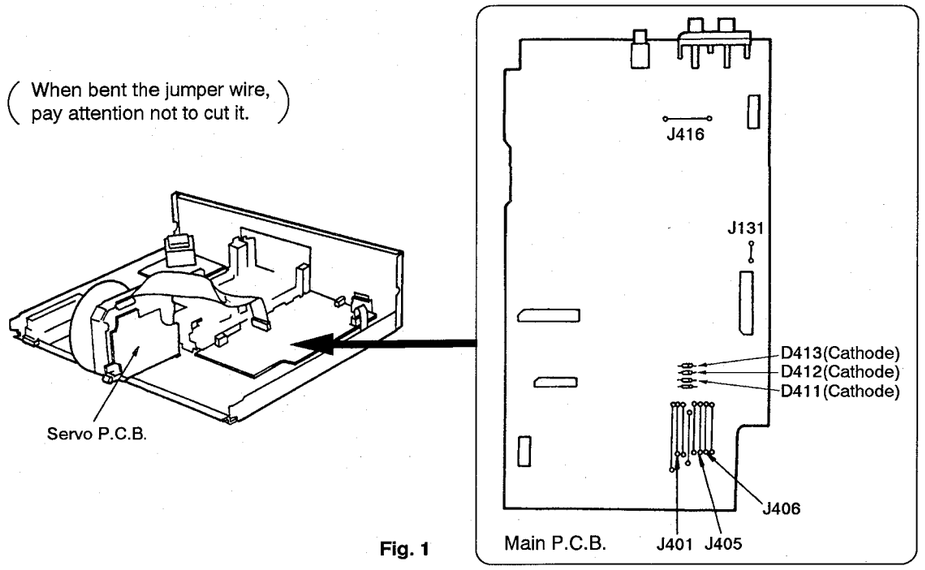
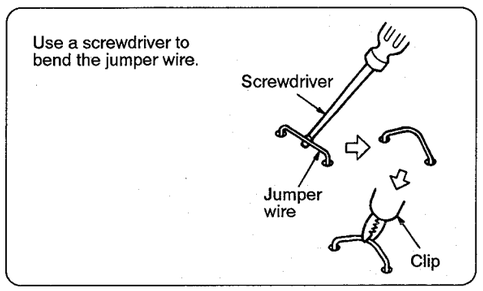



**Fig. 1**




1. Short the jumpers on the main P.C.B.
   (a. J406 - Cathode of D411 (equivalent to pressing the PLAY key)
   b. J406 - Cathode of D413 (equivalent to pressing the STOP key)
   c. J401 - Cathode of D411 (equivalent to pressing the DISC 1key))
2. Shorting J131 to J416 turns the power ON.
3. After turning on the power, open the 3 shorted jumpers (a to c) in 1.
4. Momentarily short the jumpers shown below as needed. (Fig. 1)
   - To PLAY, short J406 to cathode of D411 (equivalent to pressing the PLAY key)
   - To FWD, short J405 to cathode of D413 (equivalent to pressing the ▶▶| SKIP key)
   - To REW, short J405 to cathode of D411 (equivalent to pressing the |◀◀ SKIP key)
   - To FORWARD, short J401 to cathode of D412 (equivalent to pressing the ▶▶ SEARCH key)
   - To BACKWARD, short J401 to cathode of D413 (equivalent to pressing the ◀◀ SEARCH key)
   - To STOP, short J406 to cathode of D413 (equivalent to pressing the STOP key)
5. The operations for the 6 modes above can be performed.

# ■ DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS

## (SELF-CHECK FUNCTION)

The unit contains a function which displays the result of the automatically adjustment of the servo circuits (tracking, focus servo, etc.) as an error code on the FL display.
The error code display serves as a repair guide showing the automatically adjustment circuit is at fault. The procedures for displaying the error codes are given below.

### • Procedures to display the error code

(1) Procedure to display the error code before disassembly (finished unit)
1. When the [POWER] key is pressed while holding down the [STOP (■)], [PAUSE (▮▮)] and [PLAY (▶)] keys simultaneously, the FL display illuminates, release the power turns on.
2. When the FL display illuminates, release the [STOP (■)], [PAUSE (▮▮)] and [PLAY (▶)] keys.
3. Press the [OPEN/CLOSE (▲)] key to open the disc tray and load the test disc (SZZP1054C).
4. Press the [PLAY (▶)] key to start the play operation.
5. After the time display appears, press the [STOP (■)] key to display the error code. (e.g. **E-0**)
6. The error code display can be used as a repair guide showing which servo circuit is at fault. (See Error Code Based Troubleshooting.)

(2) Procedure to display the error code when disassembled
1. Prepare the unit as described in "How to Check the Main and Servo P.C.B." on pages 16, 17.
2. Press the [POWER] key while holding down the [STOP (■)], [PLAY (▶)] and [DISC 1] keys simultaneously.
3. When the FL display illuminates, release the [STOP (■)], [PLAY (▶)] and [DISC 1] keys.
4. Load the test disc (SZZP1054C) on the turntable and secure it with the clamper ass'y.
5. Perform steps 4 and 5 in section (1) above.

### • Error code based troubleshooting

※ The unit is satisfactory if the error code is **E-0** of **E-2**.
※ Before testing, check that the test disc is free of scratches and dirt and optical pickup is clean.

| FL error code display | Symptom | Probable cause | Signal to check | | Normal the values of voltage and waveform | |
|---|---|---|---|---|---|---|
| | | | Signal name | Location | PLAY | STOP |
| E-1 | Focus and tracking offset adjustments did not complete in the specified time period. | ① Clocks X1 and X2, power supply VDD, and reset/RST, all on IC702<br>② MDATA, MCLK, MLD, and SENSE signals to/from the mechanism controller | MDATA | IC102 ⑧ pin | PLAY 5V 0V T=13.6ms. | 4.9V |
| | | | MCLK | IC102 ⑦ pin | PLAY 5V 0V T=13.6ms. | 4.9V |
| | | | MLD | IC102 ⑨ pin | | |
| | | | SENSE | IC102 ⑩ pin | 0V | 0V |
| | | | /RST | IC102 ⑱ pin | 4.9V | 4.9V |
| | | | X1 | IC102 ㊽ pin | 1.5V p-p F=16.9344MHz | 1.5V p-p F=16.9344MHz |
| | | | X2 | IC102 ㊾ pin | 5.4V p-p F=16.9344MHz | 5.4V p-p F=16.9344MHz |
| E-3<br>E-5<br>E-7<br>E-9<br>E-B<br>E-D<br>E-F | Disc play unstable | ① Scratches or contaminants on disc surface<br>② Focus and tracking servo circuits (check waveforms, voltages, and part constants.)<br>③ Spindle driver circuit<br>④ Optical pickup | FE | IC102 ㊷ pin | PLAY 0.2V p-p 2ms.0.1V/DIV. | 2.4V |
| | | | TE | IC102 ㊸ pin | PLAY 0.3V p-p 2ms.0.1V/DIV. | 2.4V |
| | | | FOD | IC102 ㉘ pin | 2.4V | 2.4V |
| | | | TRD | IC102 ㉗ pin | 2.4V | 2.4V |
| | | | KICK | IC102 ㉖ pin | 2.4V | 2.4V |
| | | | /FLOCK | IC102 ⑪ pin | 0V | 4.9V |
| | | | /RF DET | IC102 ㊽ pin | 0V | 4.8V |
| | | | RF | TJ101 | PLAY 0.5V p-p 0.5μs 0.1V/DIV. | 3.4V |
| | | | STAT | IC102 ⑰ pin | 2.8V | 0V |



| FL error code display | Symptom | Probable cause | Signal to check | | Normal the values of voltage and waveform | |
|---|---|---|---|---|---|---|
| | | | Signal name | Location | PLAY | STOP |
| E-4<br>E-6 | Focus gain adjustment did not complete in the specified time period. | ① Scratches or contaminants on disc surface<br>② Focus servo circuit (check waveforms, voltages, and part constants.)<br>③ Optical pickup | FE | IC102 ㊷ pin | PLAY 0.2V p-p 2ms.0.1V/DIV. | 2.4V |
| | | | OFT | IC102 ㊱ pin | 0V | 0V |
| | | | /TLOCK | IC102 ⑫ pin | 0V | 0V |
| E-8<br>E-A | Tracking gain adjustment did not complete in the specified time period. | ① Scratches or contaminants on disc surface<br>② Tracking circuit (check waveforms, voltages, and part constants.)<br>③ Optical pickup | TE | IC102 ㊸ pin | PLAY 0.3V p-p 2ms.0.1V/DIV. | 2.4V |
| | | | OFT | IC102 ㊱ pin | 0V | 0V |
| | | | /TLOCK | IC102 ⑫ pin | 0V | 0V |
| E-C<br>E-E | Perform the same check as for error codes 〈E4, E6〉 and 〈E8, A〉. | | FE | IC102 ㊷ pin | PLAY 0.2V p-p 2ms.0.1V/DIV. | 2.4V |
| | | | TE | IC102 ㊸ pin | PLAY 0.3V p-p 2ms.0.1V/DIV. | 2.4V |
| | | | OFT | IC102 ㊱ pin | 0V | 0V |
| | | | /TLOCK | IC102 ⑫ pin | 0V | 0V |

# ■ NEW DIGITAL SERVO CIRCUIT

**Notes:**
1. There are two types A and B of new digital servo circuit.
2. Refer to "How to distinguish between A and B" shown below.
3. There are two types (MN66271 and MN662712RA) for IC102. When changing IC102, use MN662712RA.

### • How to distinguish between types A and B.

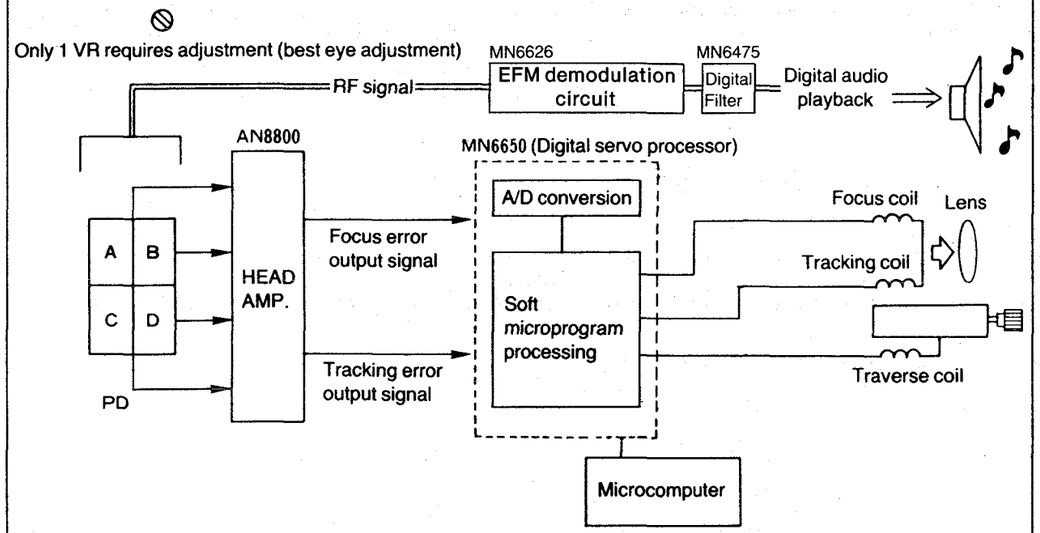
| Part No. / Ref. No. | Type A | Type B |
|---|---|---|
| IC | | |
| IC102 | MN66271 | MN662712RA |
| VARIABLE RESISTOR | | |
| VR101 | EVND3AA00B14 | Not mounted |
| RESISTORS | | |
| R114 | ERJ6GEYJ224V | ERJ6GEYJ104V |
| R134−136 | ERJ6GEY0R00V | ERJ6GEYJ331V |
| CHIP JUMPERS | | |
| RJ101 | Not mounted | ERJ6GEY0R00V |
| CAPACITORS | | |
| C105 | Not mounted | ECUV1E273KBN |
| C106 | Not mounted | ECUV1H101JCN |
| C112 | Not mounted | ECUV1E273KBN |
| C143 | Not mounted | ECBT1H331KB5 |
| C144 | Not mounted | ECBT1H331KB5 |

## ■ NEW DIGITAL SERVO SYSTEM

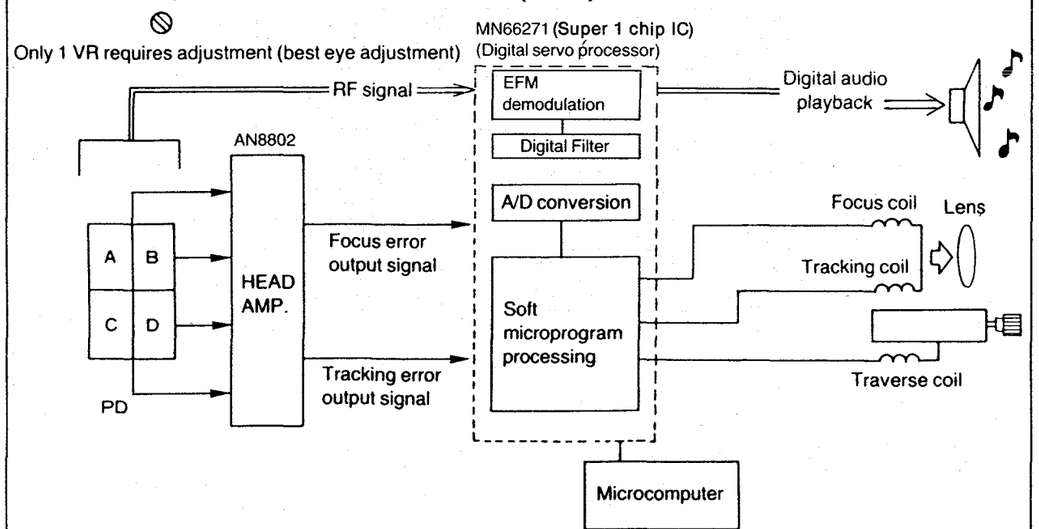
**This model employs a new digital servo circuit (super 1 chip IC: MN66271/MN662712RA). Compared to the old digital servo circuit, the following points have been improved.**

1. **Reduced number of parts**
   Use of a super 1 chip IC
   3 chips (MN6626, MN6650, MN6475) are reduced to a super 1 chip (MN66271/MN662712RA)
2. **Reduced access time**
   [(old) 2.9 seconds → (new) 1.9 seconds]
   Change of traverse gear
3. **Improved vibration resistance**
   Rubber and spring 2-level floating mechanism
   [fo=50Hz (old) → 20Hz (new)]
4. **All adjustment VRs have been deleted for type B.**

### DIGITAL SERVO SYSTEM (OLD)

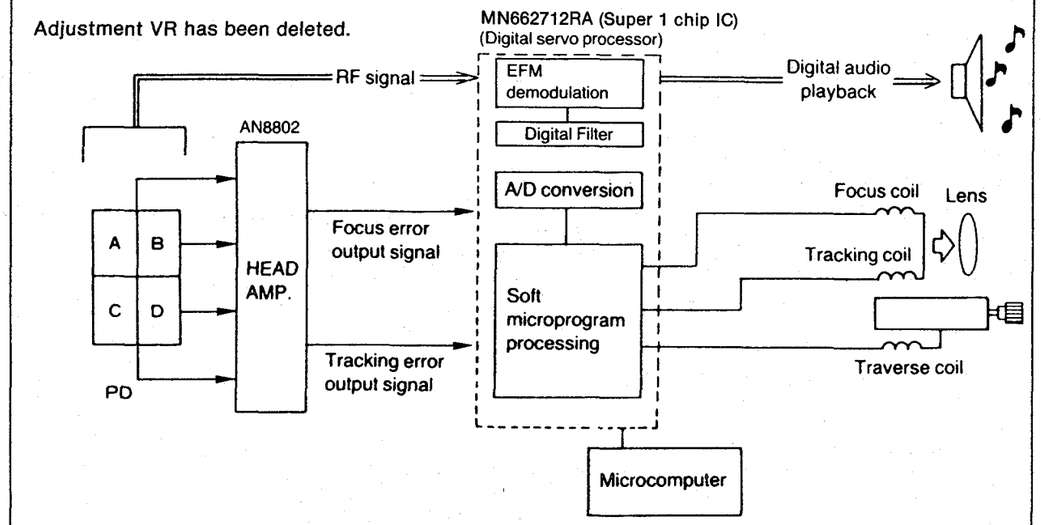



### DIGITAL SERVO SYSTEM FOR TYPE A (NEW)



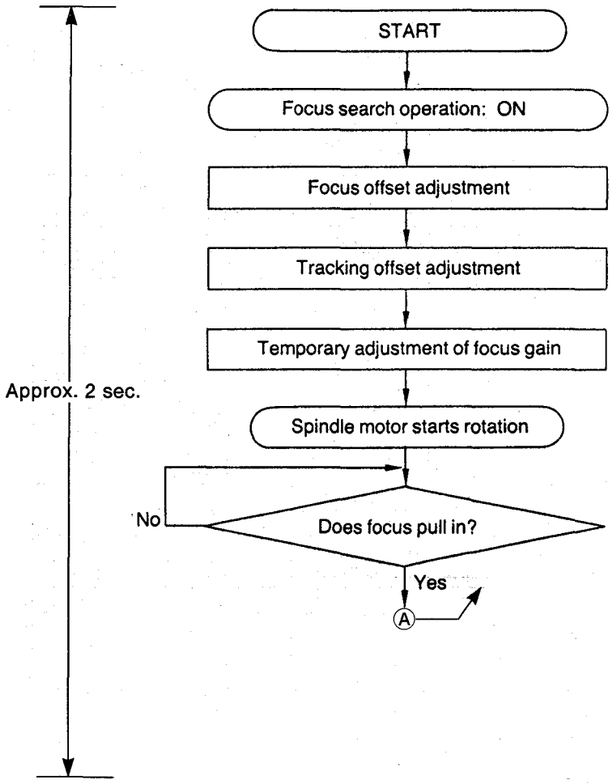



### DIGITAL SERVO SYSTEM FOR TYPE B (NEW)

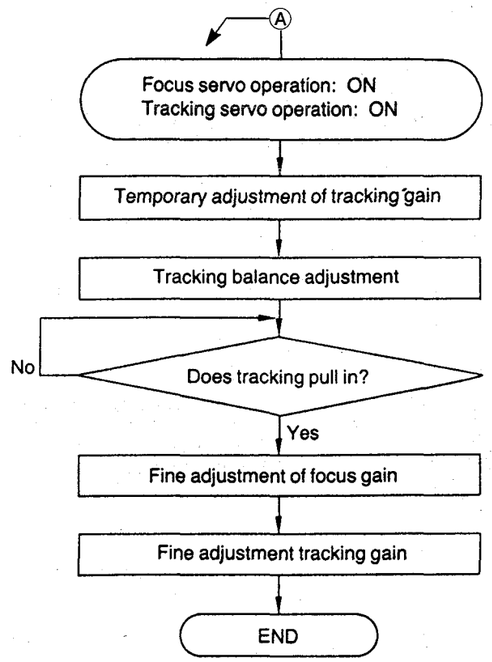



The following flow chart shows the sequence of automatic adjustments.

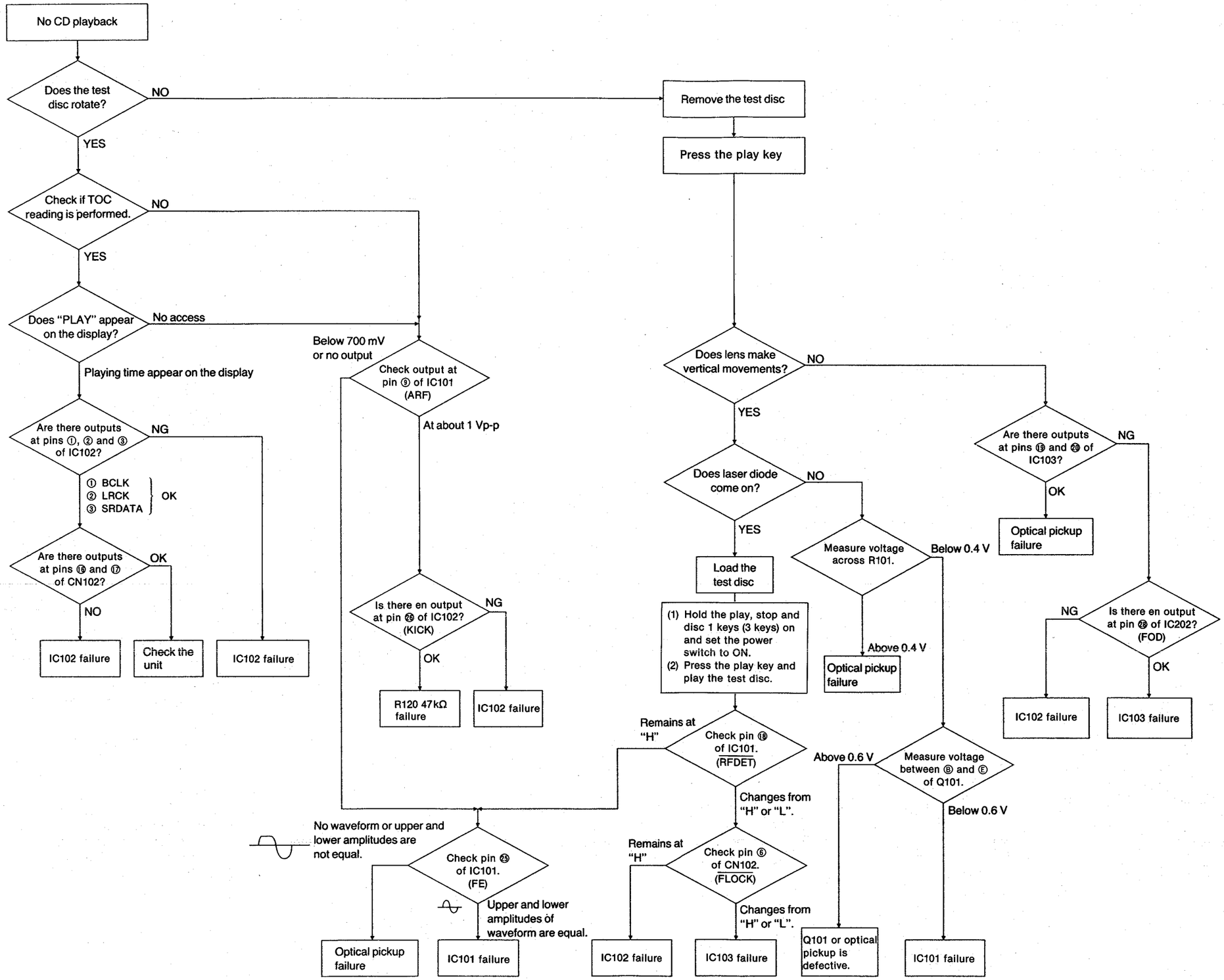
- ***Flow chart on automatic adjustment sequence***




* Because the microcomputer precisely performs automatic adjustments as shown in the flow chart, it will take approx. 5 seconds to finish reading TOC data if a used disc is eccentric one or its surface is warped.



# ■ TROUBLESHOOTING GUIDE


No CD playback
Does the test disc rotate?
NO
YES
Check if TOC reading is performed.
NO
YES
Does "PLAY" appear on the display?
No access
Playing time appear on the display
Are there outputs at pins ①, ② and ③ of IC102?
NG
① BCLK
② LRCK
③ SRDATA
OK
Are there outputs at pins ⑯ and ⑰ of CN102?
OK
NO
IC102 failure
Check the unit
IC102 failure
Below 700 mV or no output
Check output at pin ⑨ of IC101 (ARF)
At about 1 Vp-p
Is there en output at pin ㉘ of IC102? (KICK)
NG
OK
R120 47kΩ failure
IC102 failure
No waveform or upper and lower amplitudes are not equal.
Check pin ㉕ of IC101. (FE)
Upper and lower amplitudes of waveform are equal.
Optical pickup failure
IC101 failure
Remove the test disc
Press the play key
Does lens make vertical movements?
NO
YES
Does laser diode come on?
NO
YES
Load the test disc
(1) Hold the play, stop and disc 1 keys (3 keys) on and set the power switch to ON.
(2) Press the play key and play the test disc.
Measure voltage across R101.
Below 0.4 V
Above 0.4 V
Optical pickup failure
Remains at "H"
Check pin ⑱ of IC101. (RFDET)
Changes from "H" or "L".
Remains at "H"
Check pin ⑥ of CN102. (FLOCK)
Changes from "H" or "L".
IC102 failure
IC103 failure
Above 0.6 V
Measure voltage between Ⓑ and Ⓔ of Q101.
Below 0.6 V
Q101 or optical pickup is defective.
IC101 failure
Are there outputs at pins ⑲ and ⑳ of IC103?
NG
OK
Optical pickup failure
NG
Is there en output at pin ㉘ of IC202? (FOD)
OK
IC102 failure
IC103 failure

# ■ MEASUREMENTS AND ADJUSTMENTS

**Warning:** This product uses a laser diode. Refer to caution statements on page 2.

### Measuring Instruments and Special Tools

* Test discs
1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)
* Musical program disc (ordinary)
* Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1:1 probe).
* Allen wrench (M2.0) (SZZP1101C)
* Allen wrench (M1.27)
* 0.9mm clearance gauge (RZZ0297)
* Filter
* Lock paint (RZZ0L01)

## PREPARATION

1. Remove the cabinet and front panel ass'y (refer to "disassembly instructions" Ref. No. 1, 2).
2. Set the power switch to ON and press the open/close key to close the loading drawer.
3. Press the play key and when the traverse deck reaches it's height position, set the power switch to OFF.
4. Remove the tray ass'y (refer to "disassembly instructions" Ref. No. 3).
5. Remove the clamp plate, yoke, magnet and clamper (refer to "disassembly instructions" Ref. No. 8, 9).
6. Place the test disc and secure it by using clamper ass'y. (Refer to Fig. 1)
(refer to "disassembly instructions" Ref. No. 9).
7. Set the unit in the test mode as follows:
(hold the play, stop and disc 1 keys (3 keys) on and set the power switch to ON.)
8. Press the play key and play the test disc.
9. Follow the adjustment procedure.

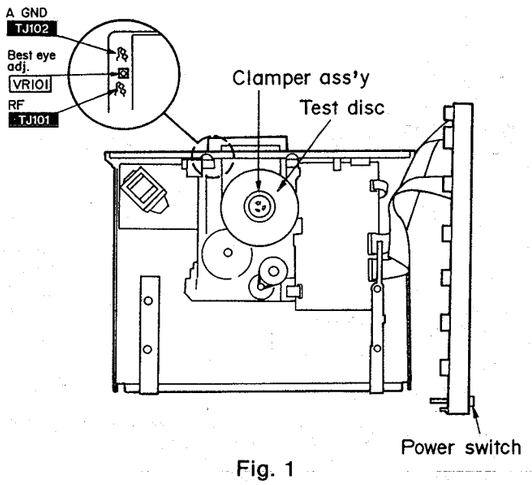


Fig. 1

### Adjusting Procedure

* If you have replaced the optical pickup, spindle motor, or turntable, do the following adjustment:

### (1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9mm clearance gauge (RZZ0297) between the turntable and the loading base. (Refer to Fig. 2).
2. Tighten the turntable retention screw with the 1.27mm allen wrench.
3. Connect the oscilloscope's CH. 1 probe across TP1 (+) and TP2 (−) terminal via a filter (Refer to Fig. 3).

**Note:** For the connection of oscilloscope's CH. 1 probe to servo P.C.B. on foil side, refer to fig. 2.

**Oscilloscope setting:** VOLT ..... 500mV
SWEEP..... 5ms.
Input coupling..... DC

4. Adjust oscilloscope's DC zero balance.
5. Switch the play power **ON**, and play the test disc (SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

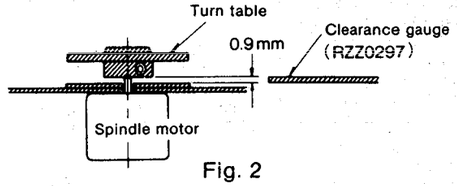


Fig. 2

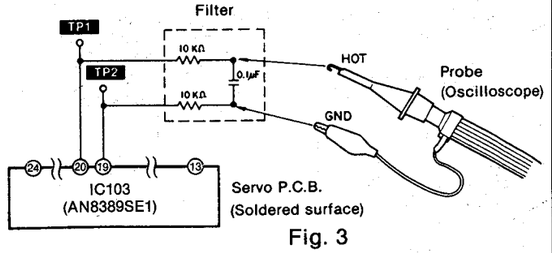


Fig. 3

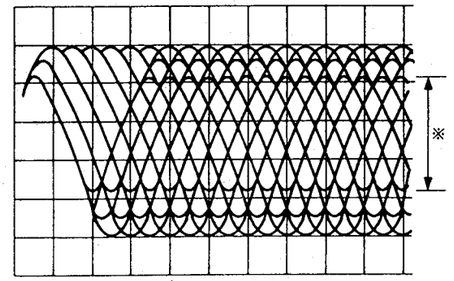
7. Adjust the height until the voltage is **0±1.0V**.
If the voltage exceeds **+1.0V**, lower turntable.
If the voltage is below **−1.0V**, elevate the turn table.

**Note:** Mesure the voltage as 0V as possible.

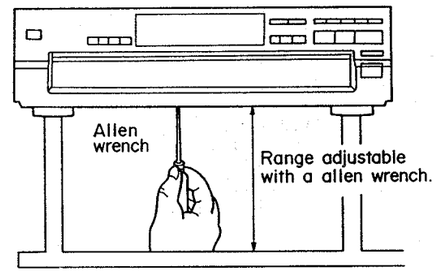


### (2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across TJ101 (+) and TJ102 (GND) on the servo P.C.B. (Refer to Fig. 1)
**Oscilloscope setting:** VOLT ..... 100mV
SWEEP..... 0.5μs.
Input coupling..... AC
2. Switch the player power **ON**, and play track **7** on the test disc (SZZP1056C).
(Playing any other track will prevent the HEX screws from being accessed.)
3. Leave the player in play mode and place it as shown Fig. 5.
4. Alternately adjust the two HEX screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 4)
5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



※ Most stretched eye pattern.
Fig. 4



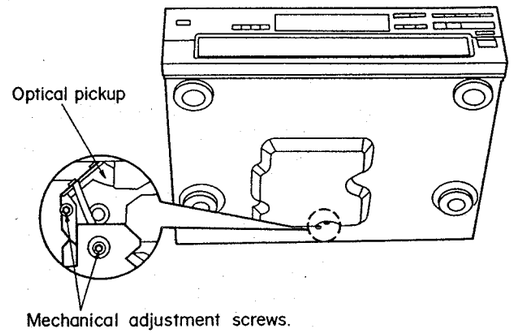
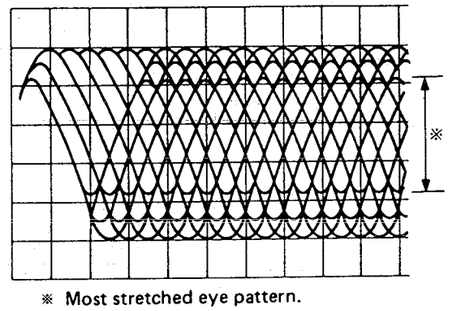



Fig. 5

### (3) BEST EYE (PD BALANCE) ADJUSTMENT FOR TYPE A

1. Connect the oscilloscope's CH. 1 probe across TJ101 (+) and TJ102 (GND) on the servo P.C.B. (Refer to Fig. 1)
**Oscilloscope setting:** VOLT ..... 100mV
SWEEP..... 0.5μs.
Input coupling..... AC
2. Switch the player power **ON**, and play the 1kHz (track 1) on the test disc (SZZP1054C).
3. Adjust **VR101** until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 6)



※ Most stretched eye pattern.
Fig. 6

### (4) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

* **Checking Skip Search**
1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

* **Checking Manual Search**
1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

* **Checking Playability**
1. Play the 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

# ■ TERMINAL FUNCTION OF IC'S

## • IC101 (AN8802SCE1V): Servo amp

| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 1 | PDAD | I | Photo detector Bch input without delay |
| 2 | PDA | I | Photo detector Ach input without delay |
| 3 | LPD | I | Laser PD signal |
| 4 | LD | O | Laser power auto control output |
| 5 | AMPI | I | RF amp terminal |
| 6 | $V_{CC}$ | I | Power supply terminal |
| 7 | AMPO | O | RF amp signal |
| 8 | CAGC | I | AGC detection capacitor input |
| 9 | ARF | O | RF signal |
| 10 | CENV | I | RF detect capacitor connection terminal |
| 11 | CEA | I | HPF-AMP capacitor connection terminal |
| 12 | GND | — | GND terminal |
| 13 | LDON | I | LD APC ON/OFF ("H": ON, "L": OFF) |
| 14 | TES | I | Tracking error shunt input ("H": shunt) |
| 15 | PLAY | I | Play signal ("H": ON, "L": OFF) |
| 16 | WVEL | I | Double velocity ("H": double, "L": single) |

| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 17 | BDO | O | Dropout detection control |
| 18 | /RFDET | O | RF det. signal ("L": det.) |
| 19 | CROSS | O | Tracking error zero cross output |
| 20 | OFTR | O | Off track detection ("H": det.) |
| 21 | VDET | O | Oscillation det. signal ("H": det.) |
| 22 | ENV | O | Envelope output terminal |
| 23 | TEBPF | I | Oscillation detect input terminal (Not used, open) |
| 24 | TE | O | Tracking error signal |
| 25 | FE | O | Focusing error signal |
| 26 | PTO | O | Potention amp output |
| 27 | PTI | I | Potention amp input |
| 28 | TBAL | I | Tracking balance adj. input |
| 29 | FBAL | I | Focus balance adj. input |
| 30 | VREF | O | Reference voltage output |
| 31 | PDB | I | Photo detector Ach input with delay |
| 32 | PDBD | I | Photo detector Bch input with delay |

## • IC103 (AN8389SE1): Coil/motor drive

| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 1 | $V_{CC}$ | I | Power supply terminal |
| 2 | VREF | I | Reference voltage input |
| 3 | IN4 | I | Motor driver (4) input |
| 4 | IN3 | I | Motor driver (3) input |
| 5 | GND | — | GND terminal |
| 6 | NC | — | Not used, connected to GND |
| 7 | NRESET | I | Reset terminal (Not used, open) |
| 8 | GND | — | GND terminal |
| 9 | IN2 | I | Motor driver (2) input |
| 10 | PC2 | I | PC2 (power cut) input |
| 11 | IN1 | I | Motor driver (1) input |
| 12 | PC1 | I | PC1 (power cut) input (Not used, open) |

| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 13 | $PV_{CC}1$ | I | Driver power suppiy (1) |
| 14 | PGND1 | — | Driver GND terminal (1) |
| 15 | D1− | O | Motor driver (1) output terminal (−) |
| 16 | D1+ | O | Motor driver (1) output terminal (+) |
| 17 | D2− | O | Motor driver (2) output terminal (−) |
| 18 | D2+ | O | Motor driver (2) output terminal (+) |
| 19 | D3− | O | Motor driver (3) output terminal (−) |
| 20 | D3+ | O | Motor driver (3) output terminal (+) |
| 21 | D4− | O | Motor driver (4) output terminal (−) |
| 22 | D4+ | O | Motor driver (4) output terminal (+) |
| 23 | PGND2 | — | Driver GND terminal (2) |
| 24 | $PV_{CC}2$ | I | Driver power supply (2) |

## • IC102 (MN66271/MN662712RA): Servo processor/digital signal processor/digital filter & D/A converter

| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 1 | BCLK | O | Serial bit clock terminal |
| 2 | LRCK | O | L/R discriminating signal |
| 3 | SRDATA | O | Serial data (Not used, open) |
| 4 | $DV_{DD}1$ | I | Power supply (digital circuit) terminal |
| 5 | $DV_{SS}1$ | — | GND (digital circuit) terminal |
| 6 | TX | O | Digital audio interface signal |
| 7 | MCLK | I | Command clock signal |
| 8 | MDATA | I | Command data signal |
| 9 | MLD | I | Command load signal ("L": LOAD) |
| 10 | SENSE | O | Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG) |
| 11 | /FLOCK | O | Optical servo condition (focus) ("L": lead-in) |
| 12 | /TLOCK | O | Optical servo condition (tracking) ("L": lead-in) |
| 13 | BLKCK | O | Sub-code block clock (f=75Hz) (Not used, open) |
| 14 | SQCK | I | Sub-code Q register clock |
| 15 | SUBQ | O | Sub-code Q data |
| 16 | DMUTE | I | Muting input ("H": MUTE) (Not used, connected to GND) |
| 17 | STAT | O | Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK) |
| 18 | /RST | I | Reset signal ("L": reset) |
| 19 | SMCK | O | System clock (f=4.2336MHz) (Not used, open) |
| 20 | PMCK | O | Frequency division clock signal (Not used, open) ($f=\frac{1}{1.92}\times ck=88.2kHz$) |
| 21 | TRV | O | Traverse servo control |
| 22 | TVD | O | Traverse drive signal |
| 23 | PC | O | Turntable motor drive signal ("L": ON) |
| 24 | ECM | O | Turntable motor drive signal (Forced mode) |
| 25 | ECS | O | Turntable motor drive signal (Servo error signal) |
| 26 | KICK | O | Kick pulse output |
| 27 | TRD | O | Tracking drive signal output |
| 28 | FOD | O | Focus drive signal output |
| 29 | VREF | I | D/A drive output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage input terminal |
| 30 | FBAL | O | Focus balance adj. output (Not used, open) |
| 31 | TBAL | O | Tracking balance adj. output |
| 32 | FE | I | Focus error signal (analog input) |
| 33 | TE | I | Tracking error signal (analog input) |
| 34 | RFENV | I | RF envelope signal |
| 35 | VDET | I | Oscillation det. signal ("H": det.) |
| 36 | OFT | I | Off frack signal ("H": Off track) |
| 37 | TRCRS | I | Track cross signal input |
| 38 | /RFDET | I | RF detection signal ("L": detection) |
| 39 | BDO | I | Dropout detection signal ("H": dropout) |
| 40 | LDON | O | Laser power control ("H": ON) |
| 41 | TES | O | Tracking error shunt output ("H": dropout) |
| 42 | PLAY | O | Play signal ("H": play) |

| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 43 | WVEL | O | Double velocity status signal ("H": double) |
| 44 | ARF | I | RF signal input |
| 45 | IREF | I | Reference current input |
| 46 | DRF | I | DSL bias terminal (Not used, open) |
| 47 | DSLF | I/O | DSL loop filter terminal |
| 48 | PLLF | I/O | PLL loop filter terminal |
| 49 | VCOF | I/O | VCO loop filter terminal (Not used, open) |
| 50 | $AV_{DD}2$ | I | Power supply (analog circuit) terminal (2) |
| 51 | $AV_{SS}2$ | — | GND (analog circuit) terminal |
| 52 | EFM | O | EFM signal (Not used, open) |
| 53 | PCK | O | PLL extract clock (f=4.3218MHz) |
| 54 | PDO | O | Phase comparated signal of EFM and PCK (Not used, open) |
| 55 | SUBC | O | Sub-code serial output data (Not used, open) |
| 56 | SBCK | I | Sub-code serial output clock (Not used, connected to GND) |
| 57 | $V_{SS}$ | — | GND terminal |
| 58 | X1 | I | Crystal oscillator terminal (f=16.9344MHz) |
| 59 | X2 | O | |
| 60 | $V_{DD}$ | I | Power supply terminal |
| 61 | BYTCK | O | Byte clock signal (Not used, open) |
| 62 | /CLDCK | O | Sub-code frame clock signal (f CLDCK=7.35kHz: Normal) (Not used, open) |

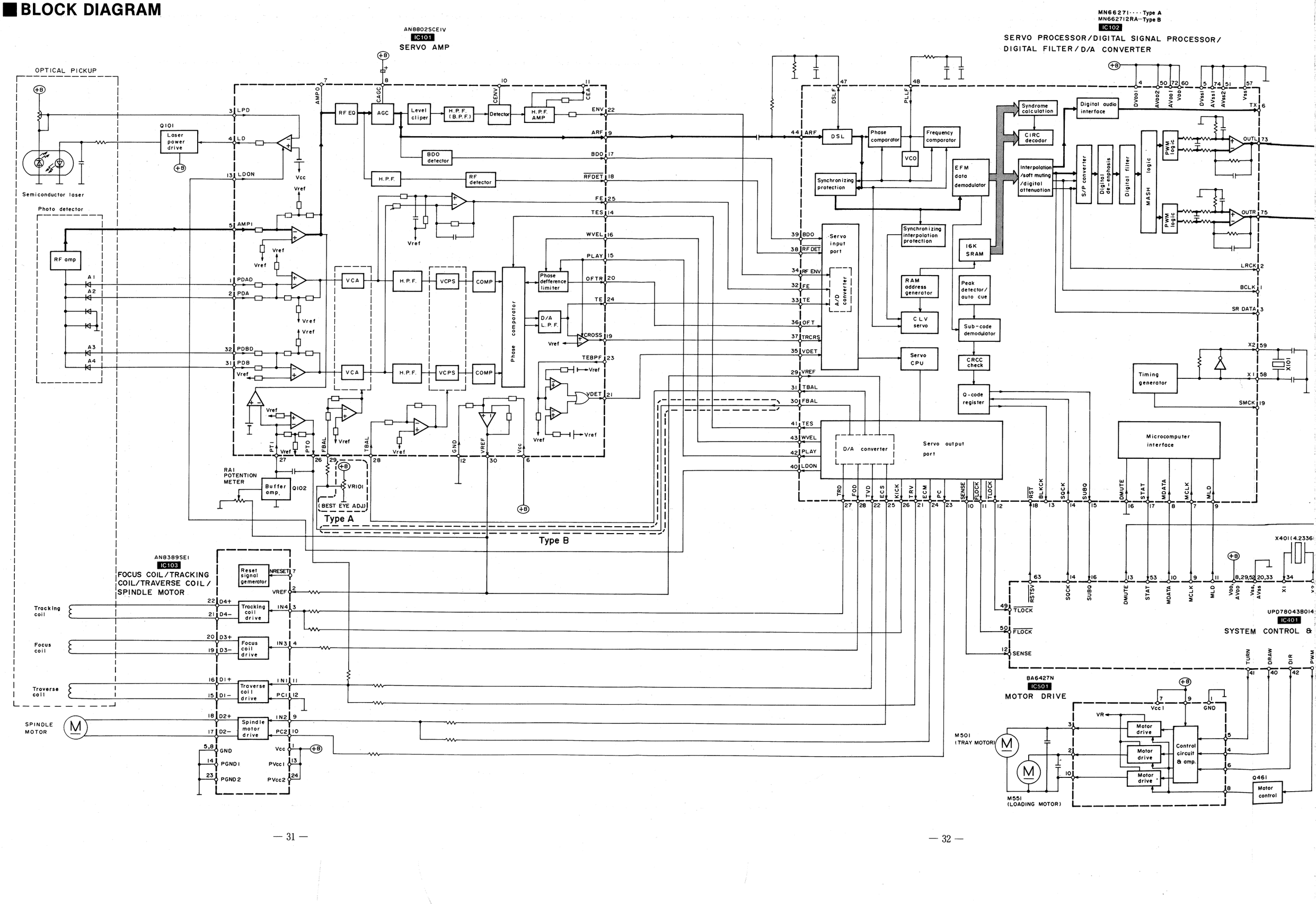
| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 63 | FCLK | O | Crystal frame clock (Not used, open) |
| 64 | IPFLAG | O | Interpolation flag terminal |
| 65 | FLAG | O | Flag terminal |
| 66 | CLVS | O | Turntable servo phase synch. signal ("H": CLV, "L": Rough servo) (Not used, open) |
| 67 | CRC | O | Sub-code CRC check terminal ("H": OK, "L": NG) |
| 68 | DEMPH | O | De-emphasis ON signal ("H": ON) (Not used, open) |
| 69 | RESY | O | Re-synchronizing signal of frame sync. (Not used, open) |
| 70 | /RST2 | I | Reset terminal after "MASH" circuit |
| 71 | /TEST | I | Test terminal (Normal: "H") |
| 72 | $AV_{DD}1$ | I | Power supply (analog circuit) terminal (1) |
| 73 | OUTL | O | Lch audio signal |
| 74 | $AV_{SS}1$ | — | GND (analog circuit) terminal (1) |
| 75 | OUTR | O | Rch audio signal |
| 76 | RSEL | I | Polarity direction control terminal of RF signal |
| 77 | CSEL | I | Frequency control terminal of crystal oscillator (Not used, connected to GND) |
| 78 | PSEL | I | Test terminal (Normal: "L") |
| 79 | MSEL | I | "SMCK" terminal frequency select ("L": SMCK=4.2336MHz) |
| 80 | SSEL | I | "SUBQ" terminal mode select ("H": Q code buffer) |
| | | | |

## • IC401 (UPD78043B014): System control & FL drive

| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 1 ∫ 7 | G7 ∫ G1 | O | FL grid signal |
| 8 | VDD | I | Power supply terminal |
| 9 | MCLK | O | Command clock signal |
| 10 | MDATA | O | Command data signal |
| 11 | MLD | O | Command load signal ("L": LOAD) |
| 12 | SENSE | I | Sense signal |
| 13 | DMUTE | O | Muting control signal |
| 14 | SQCK | O | Sub-code Q register clock |
| 15 | NC | — | Not connected |
| 16 | SUBQ | I | Sub-code Q data |
| 17 | /RESET | I | Reset signal input |
| 18 | TIMER | — | Not used, connected to GND |
| 19 | REC. EN | I | Synchro rec. control terminal |
| 20 | AVSS | — | GND terminal |
| 21 ∫ 24 | KEY IN 8 ∫ KEY IN 5 | I | Key return signal |
| 25 ∫ 28 | KEY IN 4 ∫ KEY IN 1 | I | Key return signal |
| 29 | AVDD | I | Power supply terminal |
| 30 | AVREF | I | Power supply terminal |
| 31 | XT1 | — | Not used, connected to GND |
| 32 | XT2 | — | Not used, open |
| 33 | VSS | — | GND terminal |
| 34 | X1 | I | Crystal OSC terminal (f=4.2336MHz) |
| 35 | X2 | O | |
| 36 | DISC | I | Disc det. terminal |
| 37 | OPEN | I | Open detect terminal |
| 38 | DOWN | I | Traverse deck down det. terminal |
| 39 | UP | I | Traverse deck up det. terminal |
| 40 | DRAW | O | Motor control signal |

| Pin No. | Mark | I/O Division | Function |
|---|---|---|---|
| 41 | TRUN | O | Motor control signal |
| 42 | DIR | O | |
| 43 | PWM | O | |
| 44 | POSITION | I | Rotary tray position det. terminal |
| 45 | SYNCHRO | O | Synchro rec. control terminal |
| 46 | SPEED | I | Loading motor speed sensor signal |
| 47 | REMOCON | I | Remote control signal |
| 48 | IC | — | Not used, connected to GND |
| 49 | /TLOCK | I | Optical servo condition (tracking) input |
| 50 | /FLOCK | I | Optical servo condition (focus) input |
| 51 | PITCHLED | O | Not used, open |
| 52 | VDD | I | Power supply terminal |
| 53 | STAT | I | Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK) |
| 54 ∫ 58 | KEY OUT 5 ∫ KEY OUT 1 | O | Key scan signal |
| 59 | MODEL 2 | — | Model selector terminal (Not used, open) |
| 60 | MODEL 1 | — | |
| 61 | PMETHOD | — | Not used, open |
| 62 | EMPHA | — | Not used, open |
| 63 | /RSTSV | O | Reset terminal of servo IC |
| 64 | DAC | — | Not used, open |
| 65 ∫ 70 | S12 ∫ S7 | O | FL segment signal |
| 71 | VPP | I | Power supply terminal |
| 72 ∫ 77 | S6 ∫ S1 | O | FL segment signal |
| 78 | G10 | — | Not used, open |
| 79 • 80 | G9 • G8 | O | FL grid signal |

# ■ BLOCK DIAGRAM



MN6627I····Type A
MN662712RA···Type B
IC102

SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/
DIGITAL FILTER/D/A CONVERTER

Type B

UPD78043B014
IC401
SYSTEM CONTROL & FL DRIVE

BA6427N
IC501
MOTOR DRIVE

BA4558FTI
IC801

BA4558FTI
IC451

LM2940T5M
IC11

Note:
Audio signal

# ■ SCHEMATIC DIAGRAM (Parts list on pages 46, 47, 53.)

(This schematic diagram may be modified at any time with development of new technology.)

**Note:**

- **S551** : Up/down det. switch.
- **S552** : Open det. switch.
- **S601** : Time mode (TIME MODE) select switch.
- **S602** : Spiral (SPIRAL) switch.
- **S603** : Random (RANDOM) switch.
- **S604** : Repeat (REPEAT) switch.
- **S608, 609** : Search (SEARCH) switches. (S608: ◀◀, S609: ▶▶)
- **S610~614** : Disc (DISC 1~5) switches. (S610: 1, S611: 2, S612: 3, S613: 4, S614: 5)
- **S615** : Program mode (PROGRAM MODE) switch.
- **S616, 617** : Skip (SKIP) switches. (S616: I◀◀, S617: ▶▶I)
- **S618** : Disc skip (DISC SKIP) switch.
- **S619** : Loading drawer open/close (▲ OPEN/CLOSE) switch.
- **S620** : Stop (■ STOP) switch.
- **S621** : Pause (▮▮ PAUSE) switch.
- **S622** : Play (▶ PLAY) switch.
- **S624** : Power (POWER) switch.
- **S701** : Voltage adj. switch in "240V" position. (110V↔127V↔220V↔240V) (For (GC) area only.)

- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
  Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

*The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used as occation calls. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- The supply part number is described alone in the replacement parts.

| Part No. | Production Part No. | Supply Part No. |
|---|---|---|
| IC11 | LM2940T5M | LM2940T5 |
| IC451, 801 | BA4558FT1 | SVIBA4558F |

- ▬▬ / ▬ ▬ ▬ : Positive voltage lines and negative voltage lines.
  ⋯⋯ : Audio signal lines.

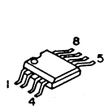
**Caution!**

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

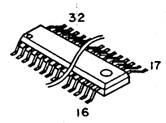
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

## • Terminal guide of IC's, transistors and diodes

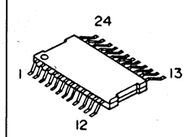
BA4558FT1



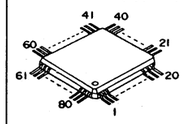

AN8802SCE1V



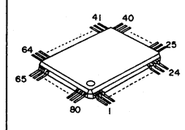

AN8389SE1



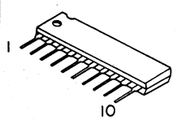

MN66271 (Type A)
MN662712RA (Type B)



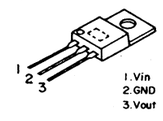

UPD78043B014



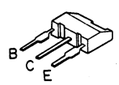

BA6247N



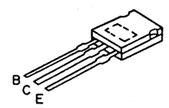

LM2940T5M

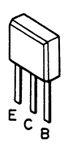



2SA1547QTV2
2SB1238QSTV6



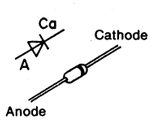

2SD2037EFTA



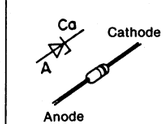




2SC3311QRSTA
2SA1309QRSTA
2SD1450RSTTA
UN4112TA
UN4212TA
UN4215TA
DTC143ESTP

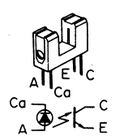
MA165TA



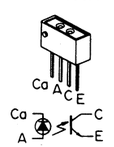

RL1N4003N02

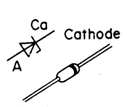



RSQGP1S53V



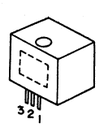

RPR-363A



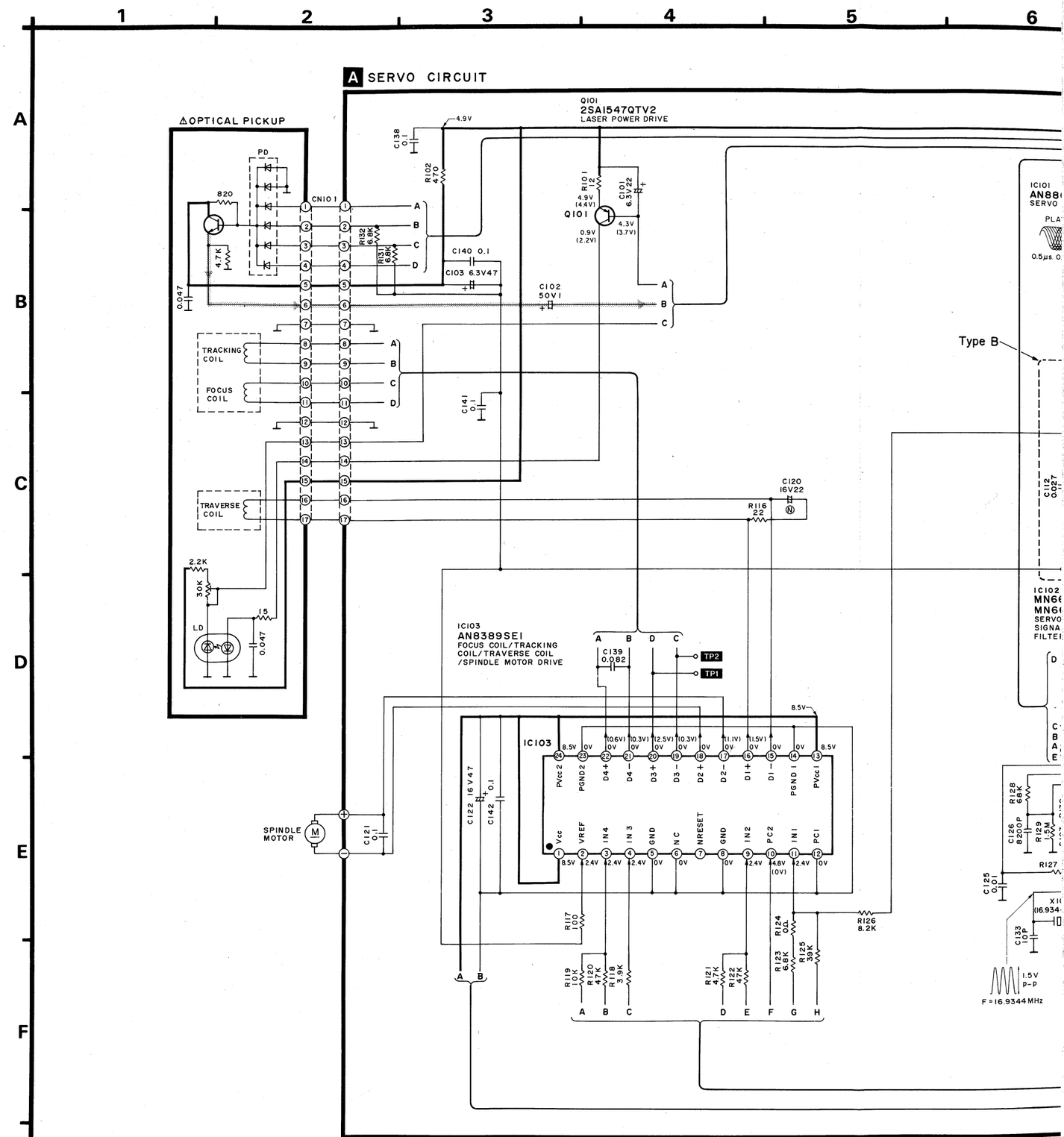

MA4091MTA
MA4100MTA
MA4270MTA
MA4082MTA
MA4062MTA
M4051MTA

RCDHC-577-E







# A SERVO CIRCUIT

△OPTICAL PICKUP

PD

820

4.7K

CN101

R132 68K

R131 6.8K

C140 0.1

C103 6.3V47

0.047

C102 50V1

TRACKING COIL

FOCUS COIL

C141 0.1

TRAVERSE COIL

C120 16V22

R116 22

2.2K

30K

15

LD

0.047

Q101
2SAI547QTV2
LASER POWER DRIVE

C138 0.1

4.9V

R102 470

R101 12

4.9V (4.4V)

Q101

0.9V (2.2V)

C101 6.3V22

4.3V (3.7V)

IC103
AN8389SE1
FOCUS COIL/TRACKING COIL/TRAVERSE COIL /SPINDLE MOTOR DRIVE

C139 0.082

TP2

TP1

8.5V

PVcc2 PGND2 D4+ D4− D3+ D3− D2+ D2− D1+ D1− PGND1 PVcc1

Vcc VREF IN4 IN3 GND NC NRESET GND IN2 PC2 IN1 PC1

SPINDLE MOTOR

C121 0.1

C122 16V47

C142 0.1

R117 100

R119 10K

R120 47K

R118 3.9K

R121 47K

R122 47K

R123 6.8K

R124 0Ω

R125 3.9K

R126 8.2K

Type B

IC101
AN8802SCE1V
SERVO AMP

C105 0.027

C106 100P

C107 50V1

(RF)

TJ101

(A.GND)

TJ102

C104 6.3V100

Play 0.5Vp-p 0.5μs. 0.1V/DIV.

PLAY 1.2V p-p 0.5μs. 0.2V/DIV.

WVEL PLAY TES LDON GND CEA CENV ARF CAGC AMPO Vcc AMPI LD LPD PDA PDAD

PLAY 0.4V p-p 2ms. 0.2V/DIV.

IC101

Q102
2SAI547QTV2
BUFFER AMP (POTENTION METER)

BDO /RFDET CROSS OFTR VDET ENV TEBPF TE FE PTO PTI TBAL FBAL VREF PDB PDBD

R110 10K

R111 10K

R113 10K

R112 1K

R115 47K

C111 330P

R114 220K···Type A 100K···Type B

R106 470

C109 0.22

R105 4.7K

VR101 10K(B)

Best eye adj.

Type A

PLAY 0.3V p-p 2ms. 0.2V/DIV.

C112 0.027

C114 470P

C117 1200P

C119 470P

R104 100

Q102

RA1 POTENTION METER(5K)

R103 12K

C108 6.3V47

PLAY 0.3V p-p 2ms. 0.1V/DIV.

PLAY 0.2V p-p 2ms. 0.1V/DIV.

Type B

IC102
MN66271 ····· Type A
MN662712RA ··· Type B
SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/DIGITAL FILTER & D/A CONVERTER

PLAY 1.2V p-p 0.5μs. 0.2V/DIV.

IC102

TES PLAY WVEL ARF IREF DRF DSLF PLLF VCOF AVDD2 AVSS2 EFM PCK PDO SUBC SBCK Vss X I X 2 Vdd

LDON BDO /RFDET TRCRS OFT VDET RFENV TE FE TBAL FBAL VREF FOD TOD KICK ECS ECM Pc TVD TRV

PLAY 5V 0V T=13.6ms.

C143 330P

C144 330P

Type B

PMCK SMCK /RST STAT D MUTE SUBQ S QCK BLKCK /TLOCK /FLOCK SENSE MLD MDATA MCLK TX DVss1 DVdd SRDATA LRCK BCLK

PLAY 5V 0V T=13.6ms.

PLAY 5V 0V T=13.6ms.

PLAY 4V p-p 1KHz, 0dB

C124 560P

R128 68K

R130 220

C126 8200P

R129 1.5M

C127 0.22

R127 150K

C125 0.01

X101 (16.9344MHz)

C133 10P

C134 10P

1.5V p-p F=16.9344MHz

5.4V p-p F=16.9344MHz

C135 6.3V100

C136 0.1

R133 100

C131 6.3V100

C132 0.1

C137 6.3V100

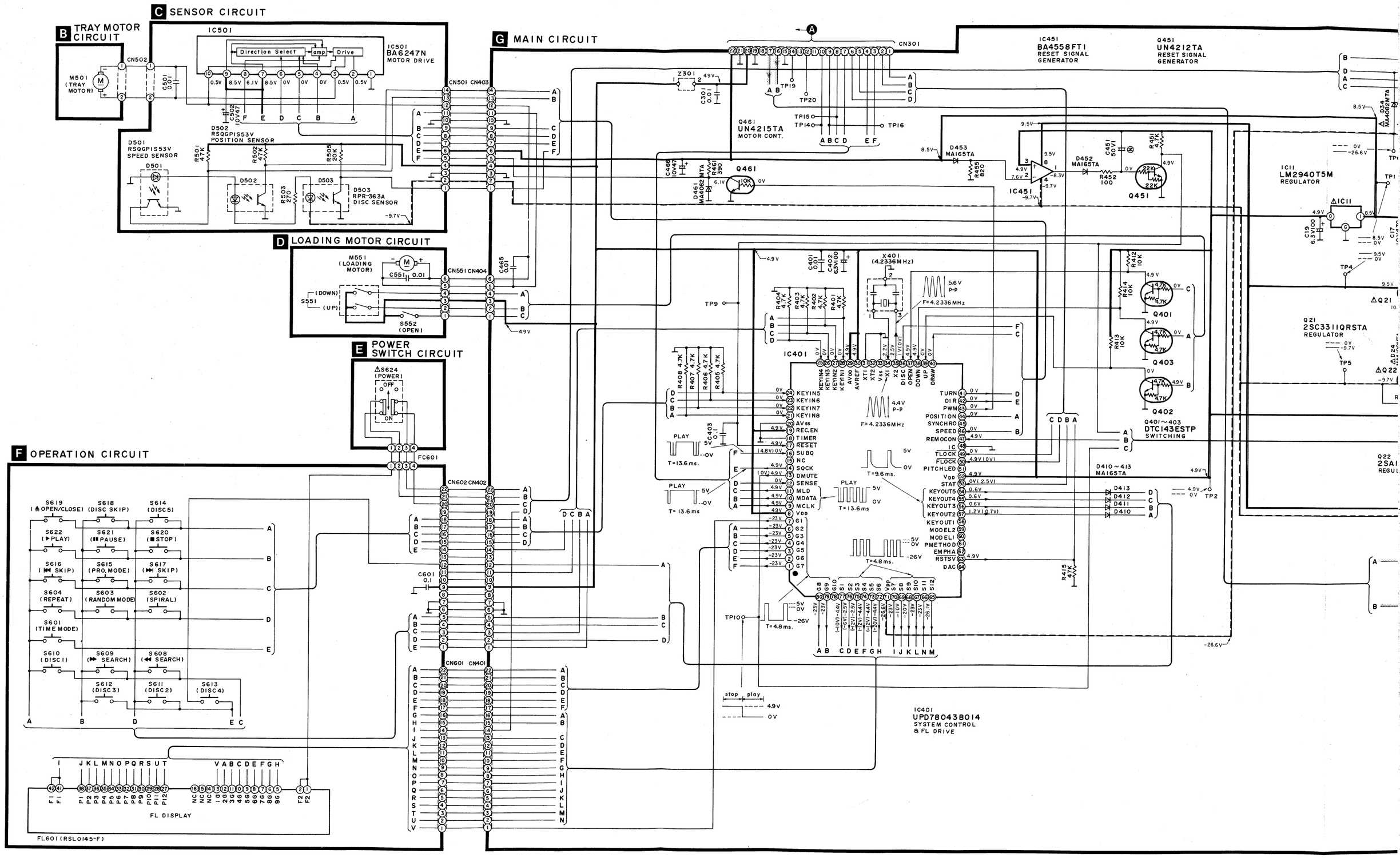
4.9V

R134, R135, R136 0Ω ··· Type A 330 ··· Type B

CN102

8.5V

A


C SENSOR CIRCUIT
B TRAY MOTOR CIRCUIT
M501 (TRAY MOTOR)
CN502
C501 0.01
IC501
Direction Select
amp
Drive
IC501 BA6247N MOTOR DRIVE
0.5V 8.5V 6.1V 8.5V 0V 0V 0V 0.5V 0.5V
C502 0.47
F E D C B A
D502 RSQGPIS53V POSITION SENSOR
D501 RSQGPIS53V SPEED SENSOR
R501 47K
R502 47K
R506 22K
D501
D502
D503
R503 270
D503 RPR-363A DISC SENSOR
-9.7V
CN501 CN403
D LOADING MOTOR CIRCUIT
M551 (LOADING MOTOR)
C551 0.01
S551 (DOWN) (UP)
S552 (OPEN)
CN551 CN404
C465 0.01
4.9V
E POWER SWITCH CIRCUIT
S624 (POWER) OFF ON
FC601
CN602 CN402
F OPERATION CIRCUIT
S619 (▲OPEN/CLOSE)
S618 (DISC SKIP)
S614 (DISC5)
S622 (▶PLAY)
S621 (❚❚PAUSE)
S620 (■STOP)
S616 (⏮SKIP)
S615 (PRO.MODE)
S617 (⏭SKIP)
S604 (REPEAT)
S603 (RANDOM MODE)
S602 (SPIRAL)
S601 (TIME MODE)
S610 (DISC1)
S609 (⏩SEARCH)
S608 (⏪SEARCH)
S612 (DISC3)
S611 (DISC2)
S613 (DISC4)
C601 0.1
CN601 CN401
FL DISPLAY
FL601 (RSL0145-F)
G MAIN CIRCUIT
CN301
Z301
C301 0.01
TP19
TP20
TP15
TP14
TP16
Q461 UN4215TA MOTOR CONT.
ABCD EF
C466 10V47
D461 MA4062MTA
R461 390
R455 820
D453 MA165TA
IC451 BA4558FTI RESET SIGNAL GENERATOR
D452 MA165TA
R452 100
C451 50V1
R451 4.7K
22K
Q451 UN4212TA RESET SIGNAL GENERATOR
IC11 LM2940T5M REGULATOR
C19 6.3V100
TP1
TP4
TP5
Q21 2SC3311QRSTA REGULATOR
Q401 Q402 Q403
R414 10K
R413 10K
R412 10K
Q401~403 DTC143ESTP SWITCHING
D410~413 MA165TA
D413 D412 D411 D410
TP2
C401 0.01
C402 6.3V100
X401 (4.2336MHz)
5.6V p-p
F=4.2336MHz
IC401
R404 4.7K
R403 4.7K
R402 4.7K
R401 4.7K
R409 4.7K
R408 4.7K
R407 4.7K
R406 4.7K
R405 4.7K
KEYIN4 KEYIN3 KEYIN2 KEYIN1 AVDD AVREF XT1 XT2 VSS VDD X2 X1 DISC OPEN DOWN UP DRAW
KEYIN5 KEYIN6 KEYIN7 KEYIN8 AVSS REC.EN TIMER RESET SUBQ NC SQCK DMUTE SENSE MLD MDATA MCLK VDD
G1 G2 G3 G4 G5 G6 G7
G8 G9 G10 S1 S2 S3 S4 S5 S6 VEE S7 S8 S9 S10 S11 S12
TURN DIR PWM POSITION SYNCHRO SPEED REMOCON IC TLOCK FLOCK PITCHLED VDD STAT
KEYOUT5 KEYOUT4 KEYOUT3 KEYOUT2 KEYOUT1 MODEL2 MODEL1 PMETHOD EMPHA RSTSV DAC
C403 0.1
PLAY 5V 0V T=13.6ms.
T=9.6ms.
T=4.8ms.
R415 47K
TP9
TP10
stop play 4.9V 0V
IC401 UPD78043B014 SYSTEM CONTROL & FL DRIVE
-26.6V

15 16 17 18 19 20 21 22 23 24

MAIN CIRCUIT

CN301

IC451
BA4558FTI
RESET SIGNAL GENERATOR

Q451
UN4212TA
RESET SIGNAL GENERATOR

Q31
2SB1238QSTV6
REGULATOR

D11,12,31,32
RLN4003N02

H POWER SUPPLY CIRCUIT For (E,GN) areas.

CN701 PT701 L701 L702 JK701 AC 230 - 240V (50/60Hz)

Q461
UN4215TA
MOTOR CONT.

IC11
LM2940T5M
REGULATOR

Q15, 16
2SD2037EFTA
REGULATOR

Q472
UN4212TA
SWITCHING (REMOTE)

Q473
2SA1309QRSTA
SWITCHING (REMOTE)

JK472 REMOTE

Q21
2SC3311QRSTA
REGULATOR

Q853 Q852 Q851
UN4112TA
MUTING CONT.

Q22
2SA1309QRSTA
REGULATOR

IC801
BA4558FTI
L.P. FILTER AMP

Q801,802
2SD1450RSTTA
MUTING

JK801 L ch R ch OUT

IC401
UPD78043B014
SYSTEM CONTROL & FL DRIVE

Q401~403
DTC143ESTP
SWITCHING

D410~413
MA165TA

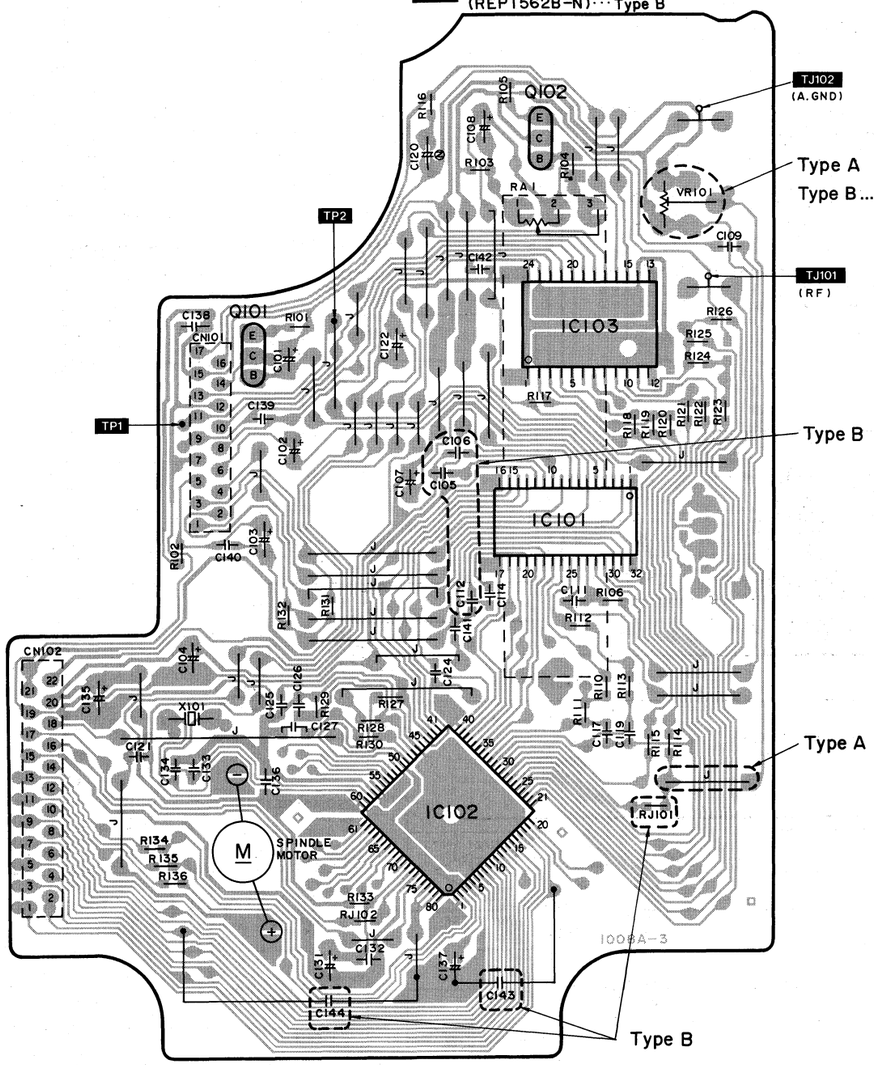
H POWER SUPPLY CIRCUIT For (GC) area.

CN701 PT701 S701 (VOLT ADJ.) 240V 220V 127V 110V L701 L702 JK701 AC 110/127/220/240V (50/60Hz)

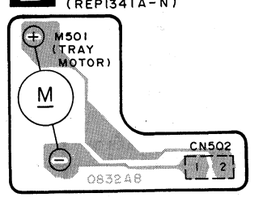
SL-PD647 SL-PD647

# ■ PRINTED CIRCUIT BOARDS

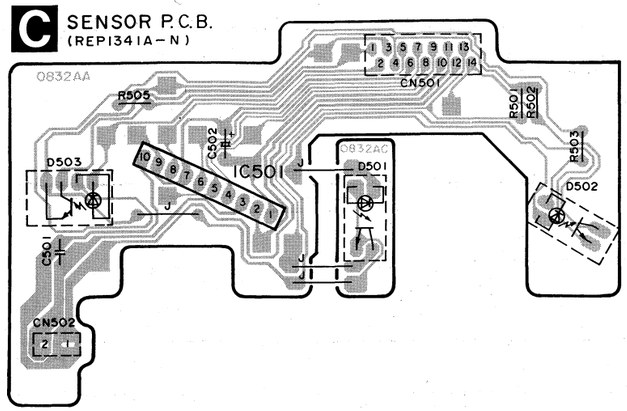
## A SERVO P.C.B.
(REP1562A-N)··· Type A
(REP1562B-N)··· Type B



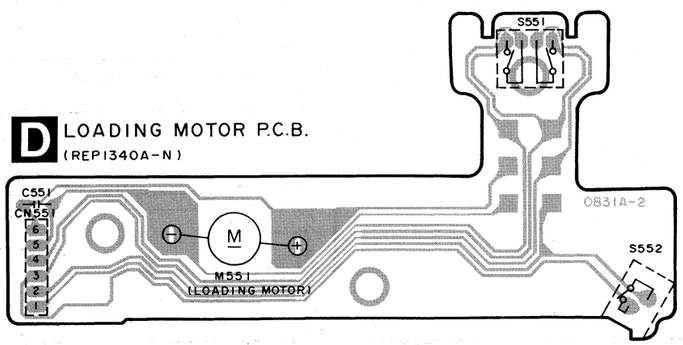

## B TRAY MOTOR P.C.B.
(REP1341A-N)



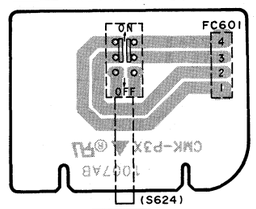

## C SENSOR P.C.B.
(REP1341A-N)



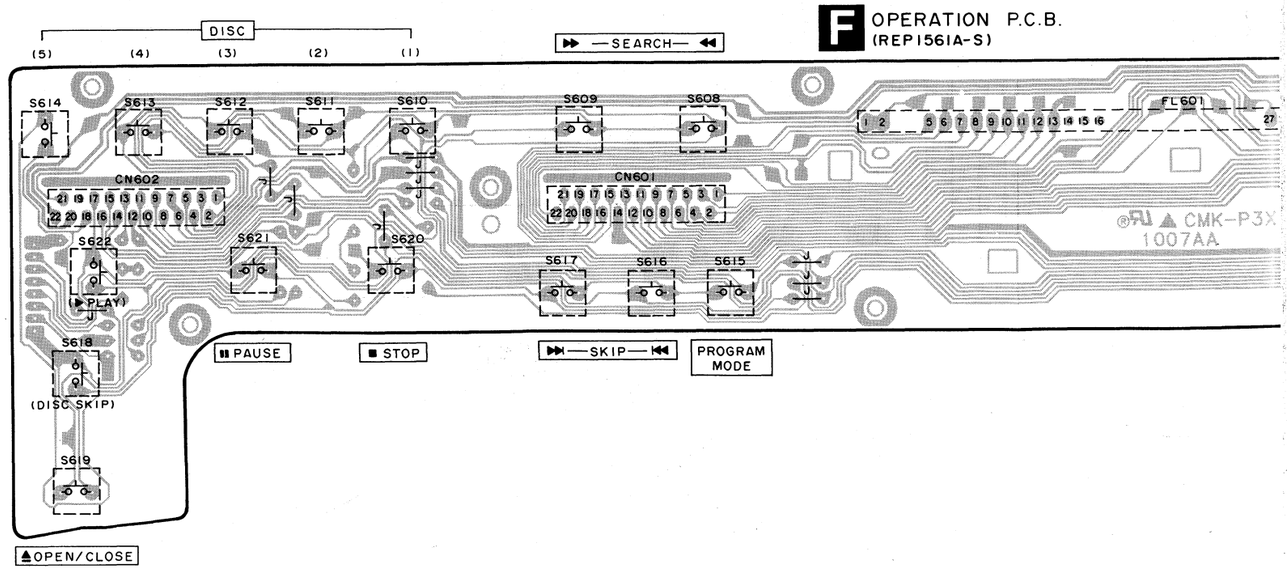

## D LOADING MOTOR P.C.B.
(REP1340A-N)



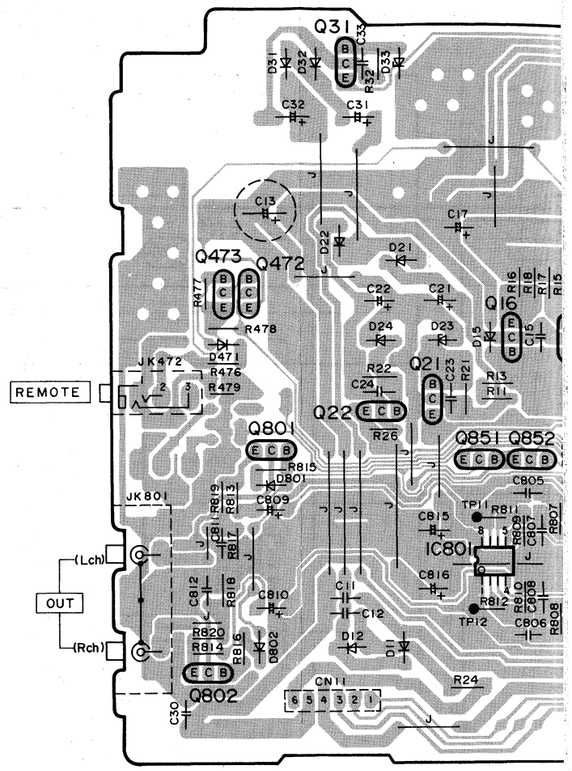

## E POWER SWITCH P.C.B.
(REP1561A-S)




## F OPERATION P.C.B.
(REP1561A-S)




## G MAIN P.C.B. (REP1560B-M)



5 6 7 8 9 10 11 12 13 14

102
GND)

ype A

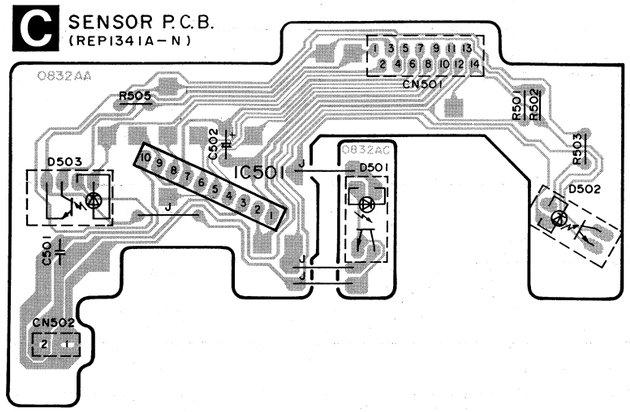
ype B..... VR101 is not installed on the P.C.B.
The foil pattern for VR101 is left open.

101
F)

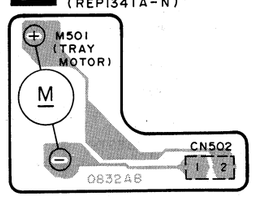
ype B

ype A

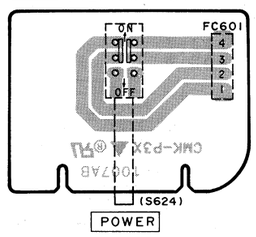
## C SENSOR P.C.B. (REPI341A-N)



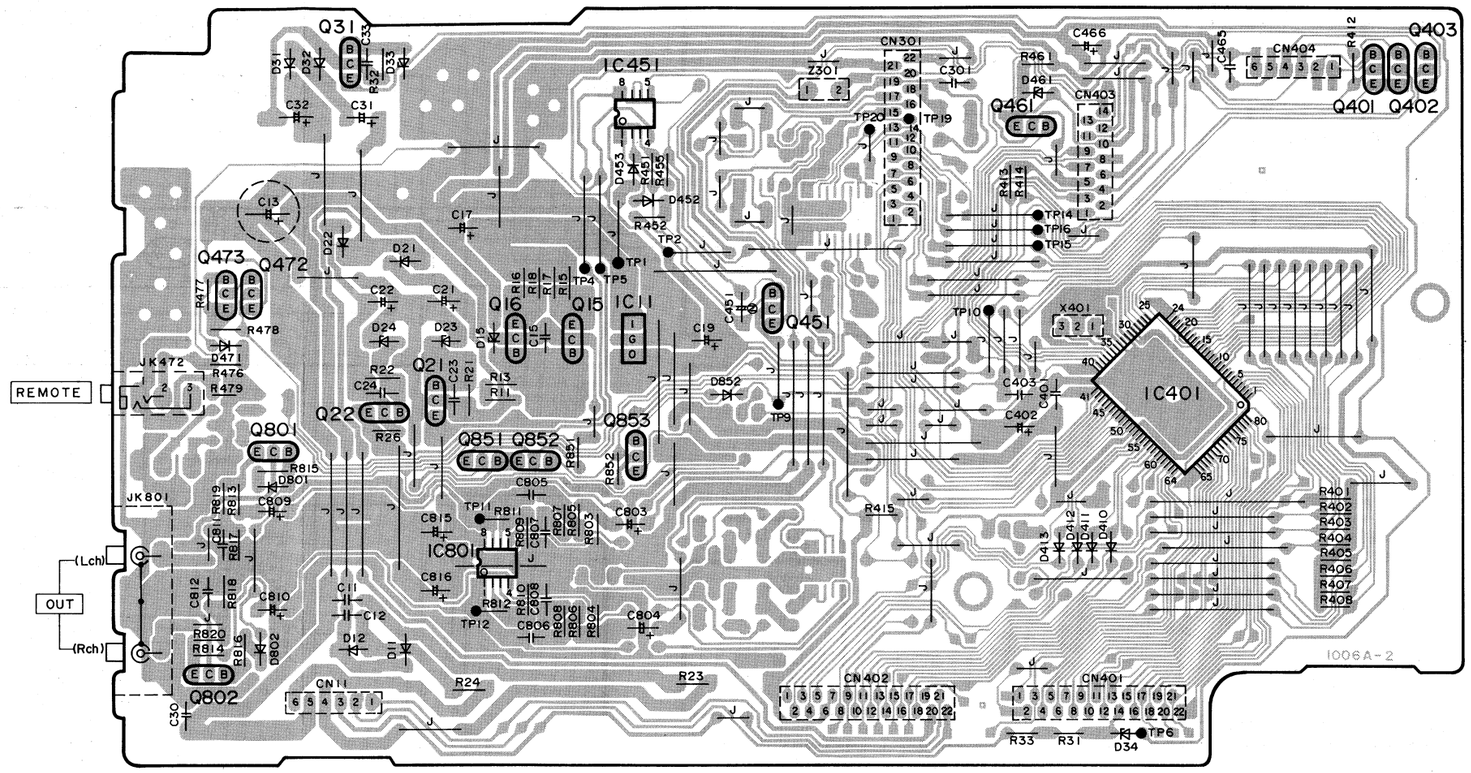

## B TRAY MOTOR P.C.B. (REPI341A-N)



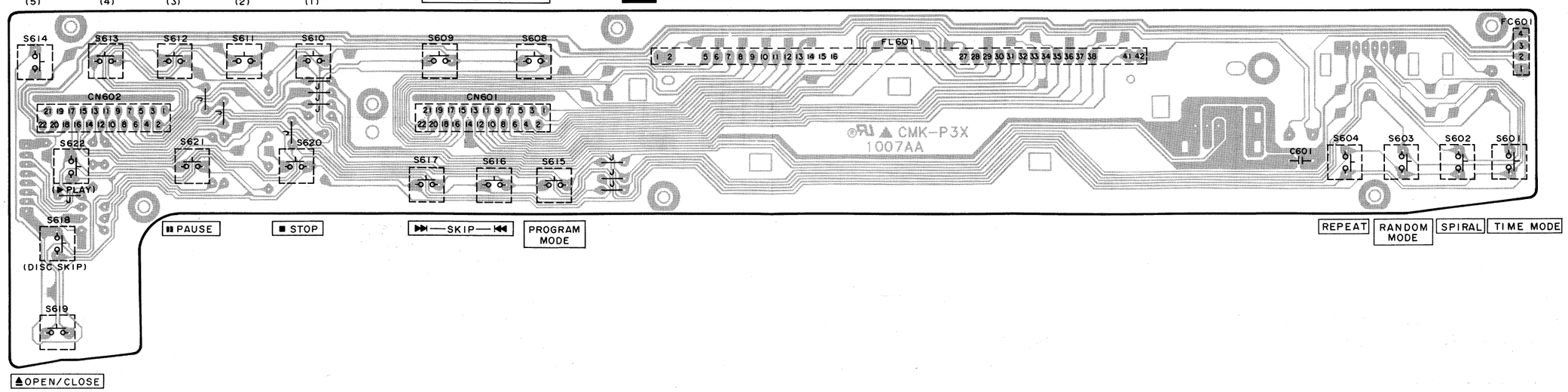

## E POWER SWITCH P.C.B. (REPI561A-S)



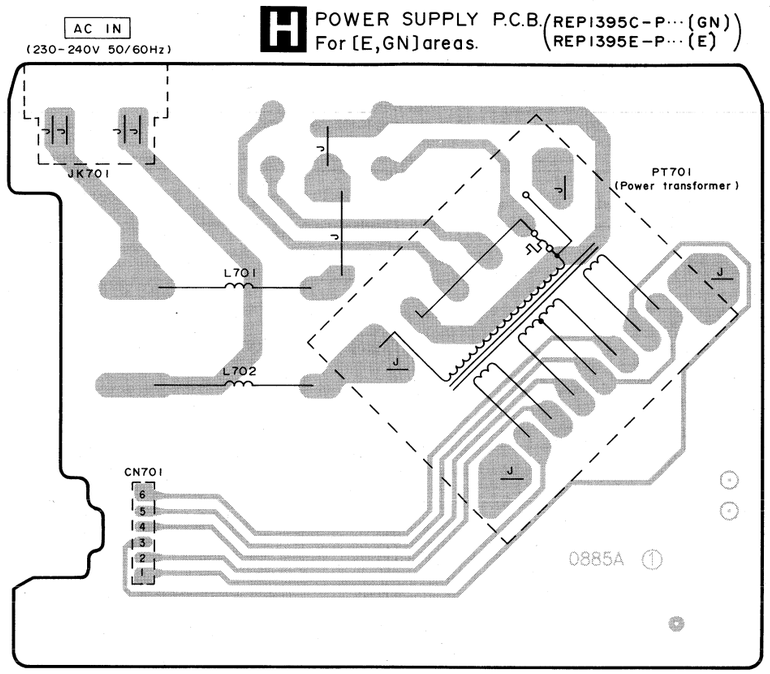

## G MAIN P.C.B. (REPI560B-M)

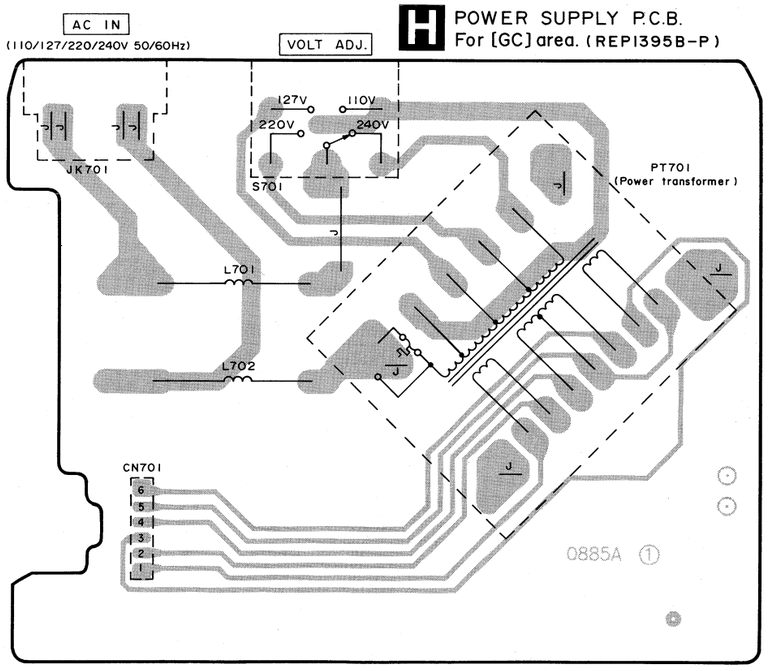



## F OPERATION P.C.B. (REPI561A-S)



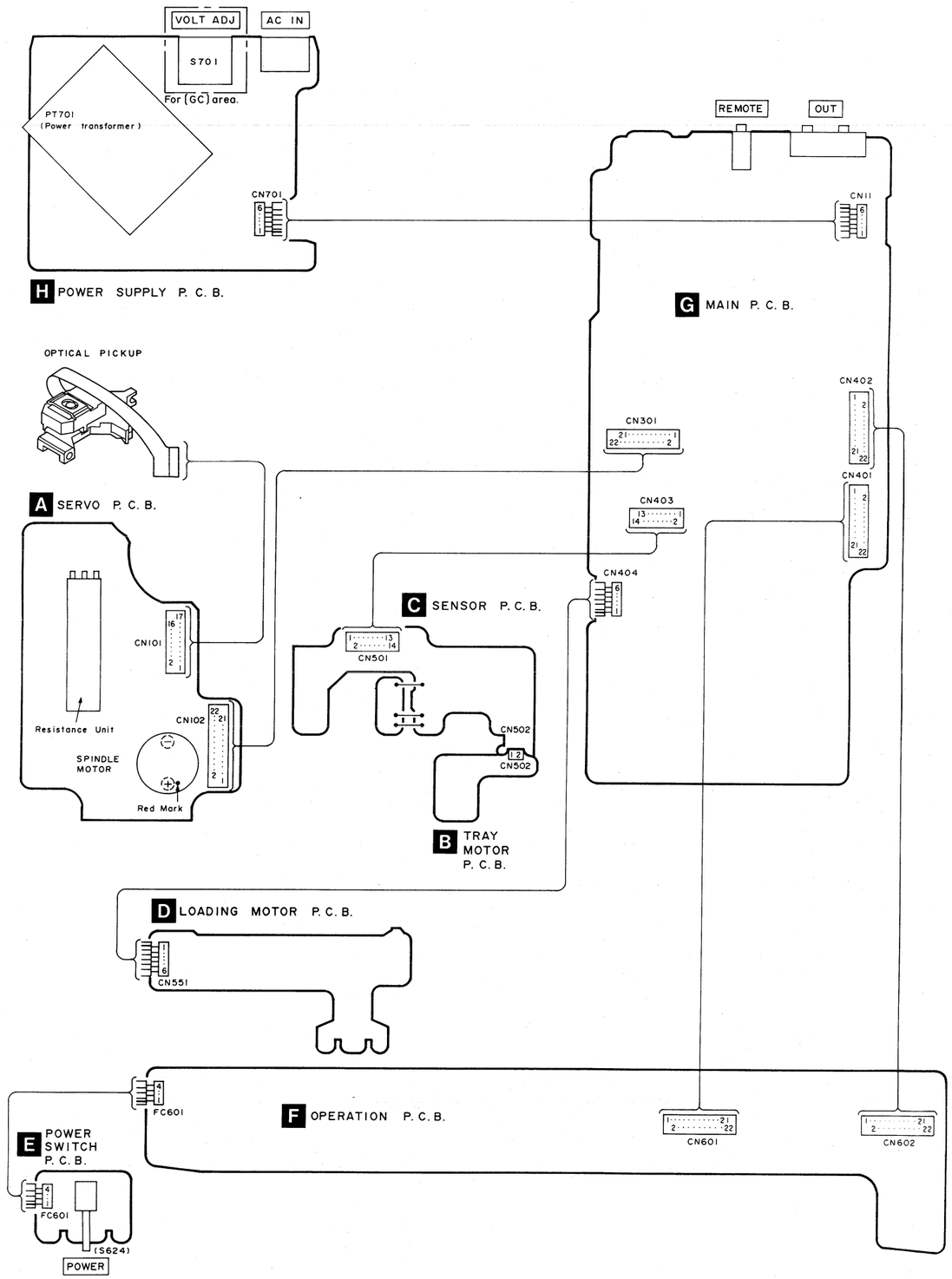
15 16 17 18 19



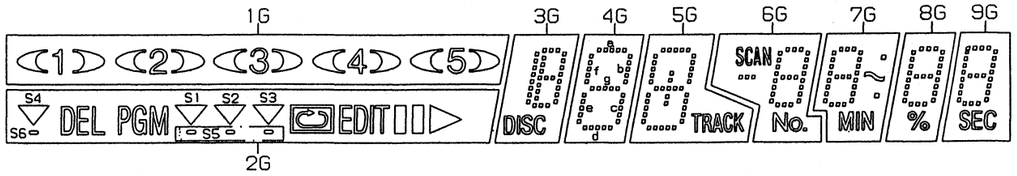



## ■ WIRING CONNECTION DIAGRAM



# ■ INTERNAL CONNECTION OF FL

## • Grid connection diagram




## • Anode connection table

| | 1G | 2G | 3G | 4G | 5G | 6G | 7G | 8G | 9G |
|---|---|---|---|---|---|---|---|---|---|
| P 1 | (1) | ▷ | a | a | a | a | a | a | a |
| P 2 | (2) | ▯▯ | b | b | b | b | b | b | b |
| P 3 | (3) | DEL | c | c | c | c | c | c | c |
| P 4 | (4) | EDIT | d | d | d | d | d | d | d |
| P 5 | (5) | ▭ | e | e | e | e | e | e | e |
| P 6 | 1 | S3 | f | f | f | f | f | f | f |
| P 7 | 2 | S2 | g | g | g | g | g | g | g |
| P 8 | 3 | S1 | DISC | – | TRACK | ▫▫▫ | MIN | % | SEC |
| P 9 | 4 | PGM | ⋮ | – | ⋮ | No. | ▫ (UPPER) | – | – |
| P10 | 5 | S5 | – | – | – | SCAN | ~ | – | – |
| P11 | – | S4 | – | – | – | – | ▫ (LOWER) | – | – |
| P12 | – | S6 | – | – | – | – | – | – | – |

## • Pin connection

| PIN NO. | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | F1 | F1 | NP | NP | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | P11 | P12 | NP | NP | NP | NP | NP | NP | NP | NP | NP | NP | NC | NC | NC | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | NP | NP | F2 | F2 |

NOTE 1) F1,F2 --- Filament
2) NP ------ No pin
3) NC ------ No connection
4) 1G~9G --- Grid



# ■ REPLACEMENT PARTS LIST

**Notes:** *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Warning: This product uses a laser diode. Refer to caution statements on page 2.
*ACHTUNG: Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen einc vom hersteller spezifizierte einheit ausgetauscht werden.
*"Type A" marked parts are used for type A only, while "Type B" marked parts are for type B only.
Parts other than "Type A" and "Type B" marked are used for both types A and B.
*There are two types (MN66271 and MN662712RA) for IC102. When changing IC102, use MW662712RA.
*The "(SF)" mark denotes the standard part.

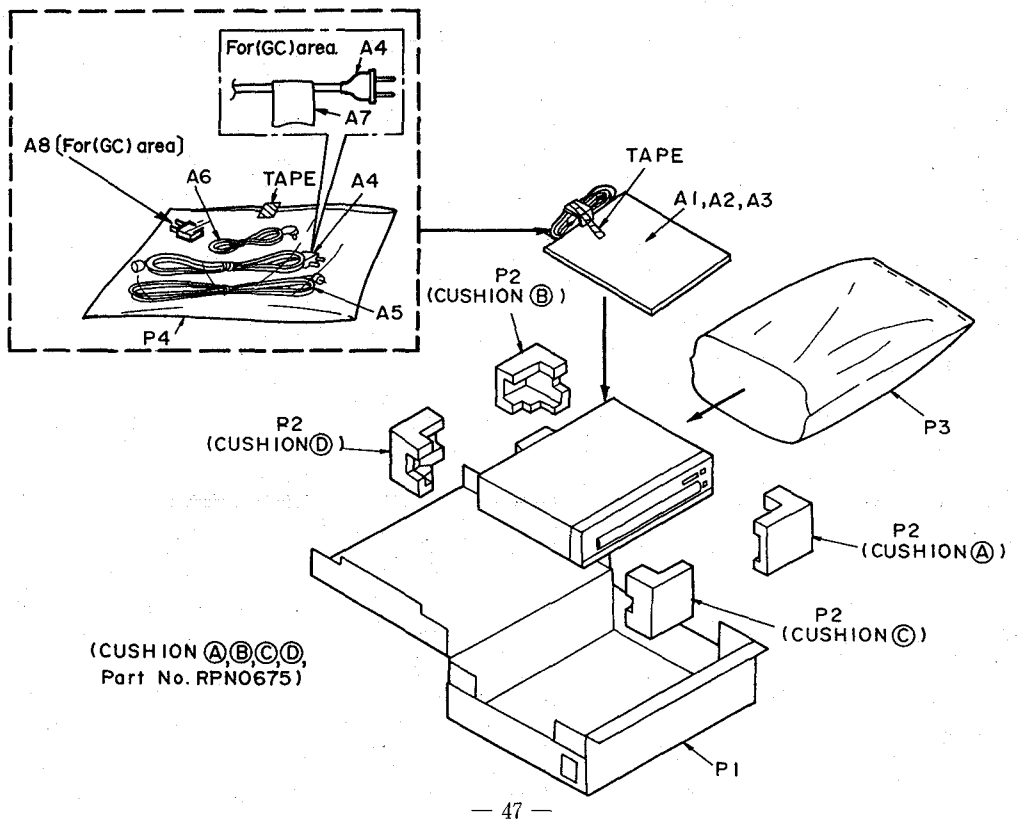
| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | INTEGRATED CIRCUIT(S) | |
| | | | |
| IC11 | LM2940T5 | IC, REGULATER | ⚠ |
| IC101 | AN8802SCE1V | IC, SERVO AMP | |
| IC102 | MN662712RA | IC, SERVO PROCESSOR | See Notes. |
| IC103 | AN8389SE1 | IC, COIL/MOTOR DRIVE | |
| IC401 | UPD78043B014 | IC, SYSTEM CONTROL&FL DRIVE | |
| IC451 | SVIBA4558F | IC, RESET SIGNAL GENERATOR | |
| IC501 | BA6247N | IC, MOTOR DRIVE | |
| IC801 | SVIBA4558F | IC, L. P. F. | |
| | | | |
| | | TRANSISTOR(S) | |
| | | | |
| Q15, 16 | 2SD2037EFTA | TRANSISTOR | ⚠ |
| Q21 | 2SC3311A-Q | TRANSISTOR | ⚠ |
| Q22 | 2SA1309A-R | TRANSISTOR | ⚠ |
| Q31 | 2SB1238QSTV6 | TRANSISTOR | ⚠ |
| Q101, 102 | 2SA1547QTV2 | TRANSISTOR | |
| Q401-403 | DTC143ESTP | TRANSISTOR | |
| Q451 | UN4212TA | TRANSISTOR | |
| Q461 | UN4215 | TRANSISTOR | |
| Q472 | UN4212TA | TRANSISTOR | |
| Q473 | 2SA1309A-R | TRANSISTOR | |
| Q801, 802 | 2SD1450RTA | TRANSISTOR | |
| Q851 | UN4112 | TRANSISTOR | |
| Q852 | UN4212TA | TRANSISTOR | |
| Q853 | UN4112 | TRANSISTOR | |
| | | | |
| | | DIODE(S) | |
| | | | |
| D11, 12 | RL1N4003N02 | DIODE | ⚠ |
| D15 | MA4091-M | DIODE | ⚠ |
| D21, 22 | RL1N4003N02 | DIODE | ⚠ |
| D23, 24 | MA4100MTA | DIODE | ⚠ |
| D31, 32 | RL1N4003N02 | DIODE | ⚠ |
| D33 | MA4270 | DIODE | ⚠ |
| D34 | MA4082MTA | DIODE | ⚠ |
| D410-413 | MA165 | DIODE | |
| D452, 453 | MA165 | DIODE | |
| D461 | MA4062MTA | DIODE | |
| D471 | MA165 | DIODE | |
| D501, 502 | RSQGP1S53V | DIODE | |
| D503 | RPR-363A | DIODE | |
| D801, 802 | MA165 | DIODE | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| D852 | MA165 | DIODE | |
| | | | |
| | | VARIABLE RESISTOR(S) | |
| | | | |
| VR101 | EVND3AA00B14 | V. R, BEST EYE ADJUSTMENT | Type A |
| | | | |
| | | TRANSFORMER(S) | |
| | | | |
| PT701 | RTP1K4B012 | POWER TRANSFORMER | (E, GN) ⚠ |
| PT701 | RTP1K4E020 | POWER TRANSFORMER | (GC) ⚠ |
| | | | |
| | | COMPONENT COMBINATION(S) | |
| | | | |
| Z301 | BL02RN2R62T4 | COMBINATION PART | |
| | | | |
| | | COIL(S) | |
| | | | |
| L701, 702 | SLQX400-D | COIL | ⚠ |
| | | | |
| | | OSCILLATOR(S) | |
| | | | |
| X101 | RSXZ16M9M01T | OSCILLATOR(16. 9344MHz) | |
| X401 | RSXY4M23M01T | OSCILLATOR(4. 2336MHz) | |
| | | | |
| | | DISPLAY TUBE(S) | |
| | | | |
| FL601 | RSL0145-F | DISPLAY TUBE | |
| | | | |
| | | SWITCH(ES) | |
| | | | |
| S551 | RSH2A001-2 | SW, UP/DOWN DETECTOR | |
| S552 | RSH1A017-U | SW, OPEN DETECTOR | |
| S601 | EVQ21405R | SW, TIME MODE | |
| S602 | EVQ21405R | SW, SPIRAL | |
| S603 | EVQ21405R | SW, RANDOM | |
| S604 | EVQ21405R | SW, REPEAT | |
| S608 | EVQ21405R | SW, R. SEARCH | |
| S609 | EVQ21405R | SW, F. SEARCH | |
| S610 | EVQ21405R | SW, DISC 1 | |
| S611 | EVQ21405R | SW, DISC 2 | |
| S612 | EVQ21405R | SW, DISC 3 | |
| S613 | EVQ21405R | SW, DISC 4 | |
| S614 | EVQ21405R | SW, DISC 5 | |
| S615 | EVQ21405R | SW, PROGRAM | |
| S616 | EVQ21405R | SW, R. SKIP | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| S617 | EVQ21405R | SW, F. SKIP | |
| S618 | EVQ21405R | SW, DISC SKIP | |
| S619 | EVQ21405R | SW, OPEN/CLOSE | |
| S620 | EVQ21405R | SW, STOP | |
| S621 | EVQ21405R | SW, PAUSE | |
| S622 | EVQ21405R | SW, PLAY | |
| S624 | SSH1230 | SW, POWER | ⚠ |
| S701 | SSR187-1 | SW, VOLTAGE ADJ. | (GC)⚠ |
| | | | |
| | | CONNECTOR(S) AND SOCKET(S) | |
| | | | |
| CN11 | RJS1A6606 | CONNECTOR(6P) | |
| CN101 | RJS1A6717-1Q | CONNECTOR(17P) | |
| CN102 | RJS1A6722-1Q | CONNECTOR(22P) | |
| CN301 | RJS1A6822 | CONNECTOR(22P) | |
| CN401, 402 | RJS1A6822 | CONNECTOR(22P) | |
| CN403 | RJS1A6814 | CONNECTOR(14P) | |
| CN404 | RJS1A6606 | CONNECTOR(6P) | |
| CN501 | RJS1A6714 | CONNECTOR(14P) | |
| CN502 | RJR0094 | SOCKET(2P) | |
| CN551 | SJT30644-H | CONNECTOR(6P) | |
| CN601, 602 | RJS1A6222 | CONNECTOR(22P) | |
| CN701 | SJT30643-V | CONNECTOR(6P) | |
| | | | |
| | | FLAT CABLE(S) | |
| | | | |
| FC601 | REZ0455-1 | FLAT CABLE(4P) | |
| | | | |
| | | JACK(S) | |
| | | | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| JK472 | RJJ33TR01 | REMOTE CONTROL | |
| JK701 | SJS9236 | AC INLET | (E, GC)⚠ |
| JK701 | SJSD16 | AC INLET | (GN)⚠ |
| JK801 | RJH3201N | LINE OUT | |
| | | | |
| | | MAGNET RESISTOR ELEMENTS | |
| | | | |
| RA1 | EWS7M0A00Q53 | RESISTANS UNIT | |
| | | | |
| | | PACKING MATERIAL | |
| | | | |
| P1 | RPG1495 | PACKING CASE | |
| P2 | RPN0675 | CUSHION | |
| P3 | XZB60X65A01Z | PROTECTION BAG(UNIT) | |
| P4 | XZB22X20C03 | PROTECTION BAG(CORD) | |
| | | | |
| | | ACCESSORIES | |
| | | | |
| A1 | RQT1987-E | INSTRUCTION MANUAL | (E) |
| A1 | RFKSLPD647GC | INSTRUCTION MANUAL ASS'Y | (GC) |
| A1 | RQT1839-L | INSTRUCTION MANUAL | (GN) |
| A2 | RQA0013 | WARRANTY CARD | (E) |
| A2 | RQX7433ZA | WARRANTY CARD | (GN) |
| A3 | RQCB0169 | SERVICENTER LIST | |
| A4 | RJA0019-2K | AC POWER SUPPLY CORD | (E, GC)⚠(SF) |
| A4 | SJA173 | AC POWER SUPPLY CORD | (GN)⚠(SF) |
| A5 | SJP2249-3 | STEREO CONNECTION CABLE | |
| A6 | SJP2257T | REMOTE CONTROL CABLE | |
| A7 | RQLA0134 | VOLTAGE CAUTION LABEL | (GC) |
| A8 | SJP5213-2 | POWER PLUG ADAPTOR | (GC)⚠ |

## ■ PACKAGING



# ■ REPLACEMENT PARTS LIST

**Notes :** * **Warning: This product uses a laser diode. Refer to caution statements on page 2.**

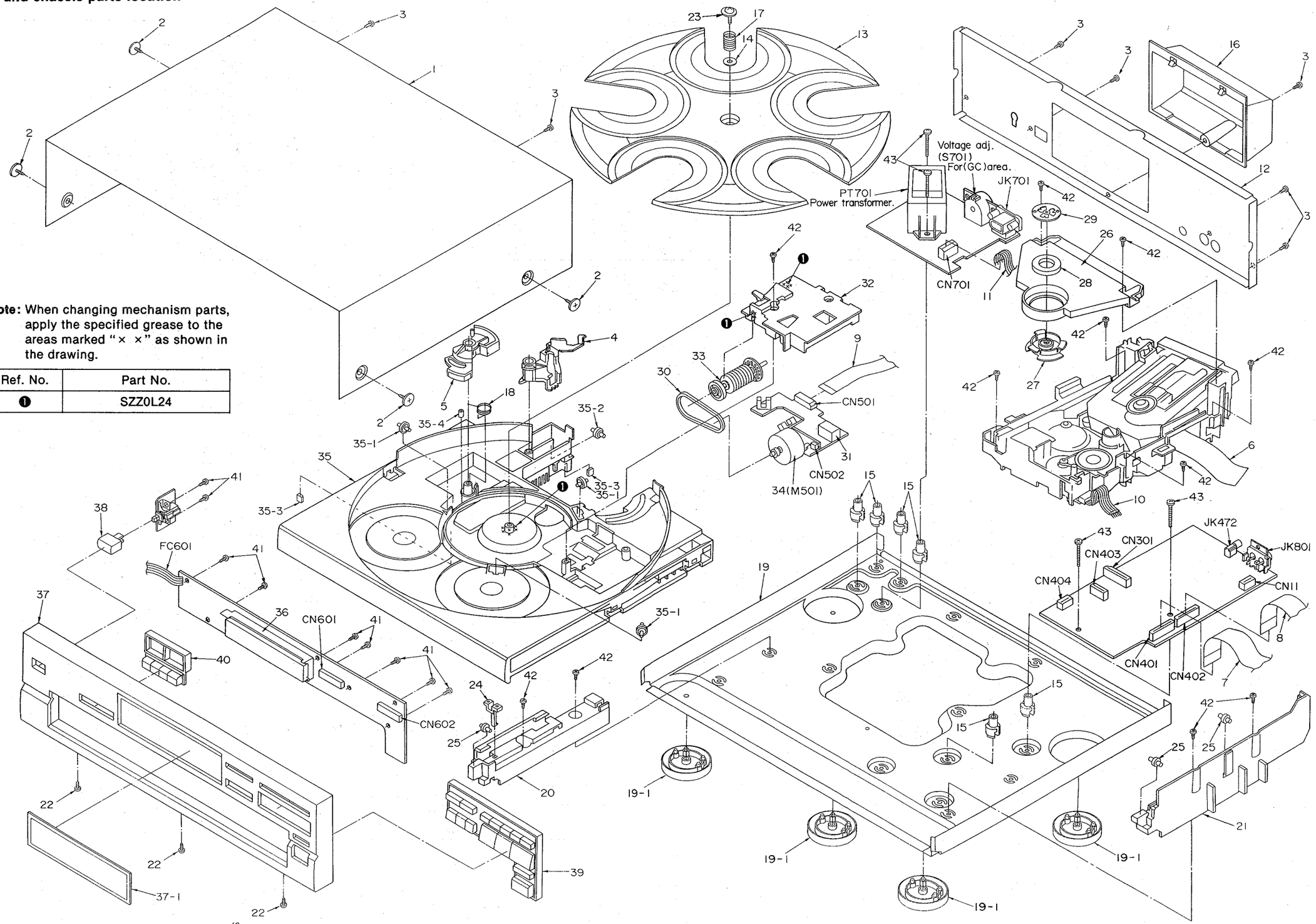
| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | CABINET AND CHASSIS | |
| | | | |
| 1 | RKM0193-K | CABINET | |
| 2 | SNE2129-3 | SCREW | |
| 3 | XTBS3+8JFZ1 | SCREW | |
| 4 | RDG0239 | OPEN LOCK GEAR | |
| 5 | RDG0199-2 | CLOSE LOCK GEAR | |
| 6 | REZ0590 | FPC BOARD(22P) | |
| 7 | REZ0474 | FPC BOARD(22P) | |
| 8 | REZ0475 | FPC BOARD(22P) | |
| 9 | REZ0476 | FPC BOARD(14P) | |
| 10 | REZ0477 | FLAT CABLE(6P) | |
| 11 | REZ0478 | FLAT CABLE(6P) | |
| 12 | RFKHLPD647EK | REAR PANEL ASS'Y | (E) |
| 12 | RFKHLPD647GC | REAR PANEL ASS'Y | (GC) |
| 12 | RFKHLPD647GN | REAR PANEL ASS'Y | (GN) |
| 13 | RGT0007 | ROTARY TRAY | |
| 14 | RHW81001-1 | WASHER | |
| 15 | RKQ0089 | P.C.B. SUPPORT | |
| 16 | RKQ0104 | REAR COVER | |
| 17 | RMB0255 | SPRING(DISC TRAY) | |
| 18 | RME0133-1 | SPRING(LOCK GER) | |
| 19 | RFKJLPD627PK | CHASSIS ASS'Y | |
| 19-1 | RKA0053-A | FOOT | |
| 20 | RMR0540-K1 | TRAY BASE GUIDE(L) | |
| 21 | RMR0593-K | TRAY BASE GUIDE(R) | |
| 22 | XTB3+8JFZ | SCREW | |
| 23 | XTWS3+10T | SCREW | |
| 24 | RMR0575-W | SLIDER(B) | |
| 25 | RMR0577-W | ROLLER | |
| 26 | RFKNLPD827GC | CLAMP PLATE ASS'Y | |
| 27 | SIRD51-1 | CLAMPER | |
| 28 | SOMD4 | MAGNET | |
| 29 | SOYD2 | YOKE | |
| 30 | RDV0024 | BELT | |
| 31 | RMN0174 | SENSOR HOLDER | |
| 32 | RMR0547-K | WORM BASE | |
| 33 | RXG0026 | WORM ASS'Y | |
| 34 | REM0026 | TRAY MOTOR ASS'Y(M501) | |
| 35 | RXQ0289 | TRAY ASS'Y | |
| 35-1 | RMR0546-K | TRAY ROLLER | |
| 35-2 | RMR0564-W2 | ROLLER(A) | |
| 35-3 | RMG0269-H1 | CUSHION RUBBER | |
| 35-4 | RMG0200 | RUBBER | |
| 36 | RMN0172 | FL HOLDER | |
| 37 | RFKGLPD647EK | FRONT PANEL ASS'Y | |
| 37-1 | RGK0470 | FRONT ORNAMENT PLATE | |
| 38 | RGU0030 | POWER BUTTON | |
| 39 | RGU0726 | MAIN BUTTON | |
| 40 | RGU0727 | SUB BUTTON | |
| 41 | XTB26+8J | SCREW | |
| 42 | XTB3+10JFZ | SCREW | |
| 43 | XTB3+20J | SCREW | |
| | | | |
| | | LOADING MECHANISM | |
| | | | |
| 101 | SJED10 | POTENTIOMETER HOLDER | |
| 102 | RME0115 | SIDE PRESSURE SPRING | |
| 103 | RMQ0299 | SCREW | |
| 104 | RMR0463 | ROLLER | |
| 105 | SDOD28-2E | TURNTABLE | |
| 105-1 | XXE26D5 | SCREW | |
| 106 | SDOD29-2 | TURNTABLE RING | |
| 107 | SRQA010N04 | TURNTABLE SPRING | |
| 108 | RXQ0232 | SIDE PRESSSURE PULLEY | |
| 109 | SHRD176-E | BRUSH HOLDER | |
| 110 | SISD22-7 | TRAVERSE BASE | |
| 111 | SJGDRF310T-2 | SPINDLE MOTOR | |
| 112 | SNSD31 | SCREW | |
| 113 | SUWD112-2 | SHAFT HOLDER | |
| 114 | SUXD123-1 | GUIDE SHAFT | |
| 115 | SOAD70A | OPTICAL PICKUP | |
| 116 | RFKNLPC363P | YOKE(A) ASS'Y | |
| 117 | SORD46-E | COIL ASS'Y | |
| 118 | SOYD22-1 | YOKE(B) | |
| 119 | XTB3+10G | SCREW | |
| 120 | XTN2+5G | SCREW | |
| 121 | SHGD148 | STOPPER RUBBER | |
| 122 | SHWD33 | WASHER | |
| 123 | SHWD34 | WASHER | |
| 124 | RDG0196-1 | DRIVE GEAR(B) | |
| 125 | RDK0017 | DRIVE CAM | |
| 126 | RDK0018 | ELEVATION CAM | |
| 127 | RDP0050 | PULLEY GEAR | |
| 128 | RXQ0252 | LOADING MOTOR ASS'Y(M551) | |
| 129 | RXQ0302 | MECHANISM BASE ASS'Y | |
| 130 | RXQ0251 | SUB BASE ASS'Y | |
| 131 | RHD30029 | SCREW | |
| 132 | RHD30030 | SCREW | |
| 133 | RHD30031 | SCREW | |
| 134 | RMA0581 | REINFORCING PLATE | |
| 135 | RMG0268-K | BELT | |
| 136 | RDG0195 | DRIVE GEAR(A) | |
| 137 | RMR0565-W3 | SLIDER | |
| 138 | SHGD153-1 | FLOATING RUBBER | |
| 139 | SUSD136-1 | FLOATING SPRING(A) | |
| 140 | SUSD137-1 | FLOATING SPRING(B) | |
| 141 | SUSD145-1 | FLOATING SPRING(C) | |
| 142 | XTB3+10JFZ | SCREW | |
| 143 | RDG0194 | REDUCTION GEAR | |
| | | | |
| | | | |
| | | | |

# ■ EXPLODED VIEWS

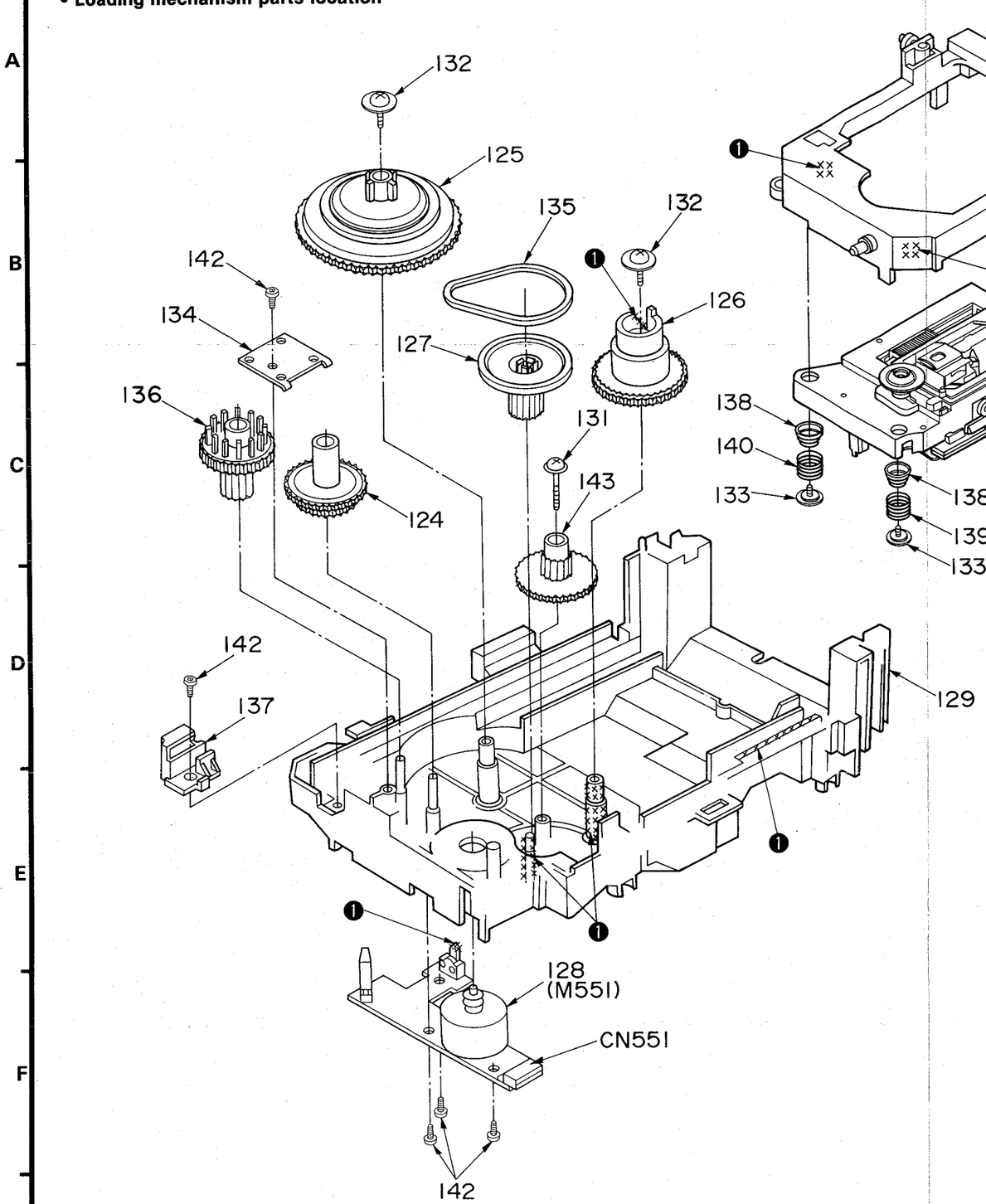
**• Cabinet and chassis parts location**

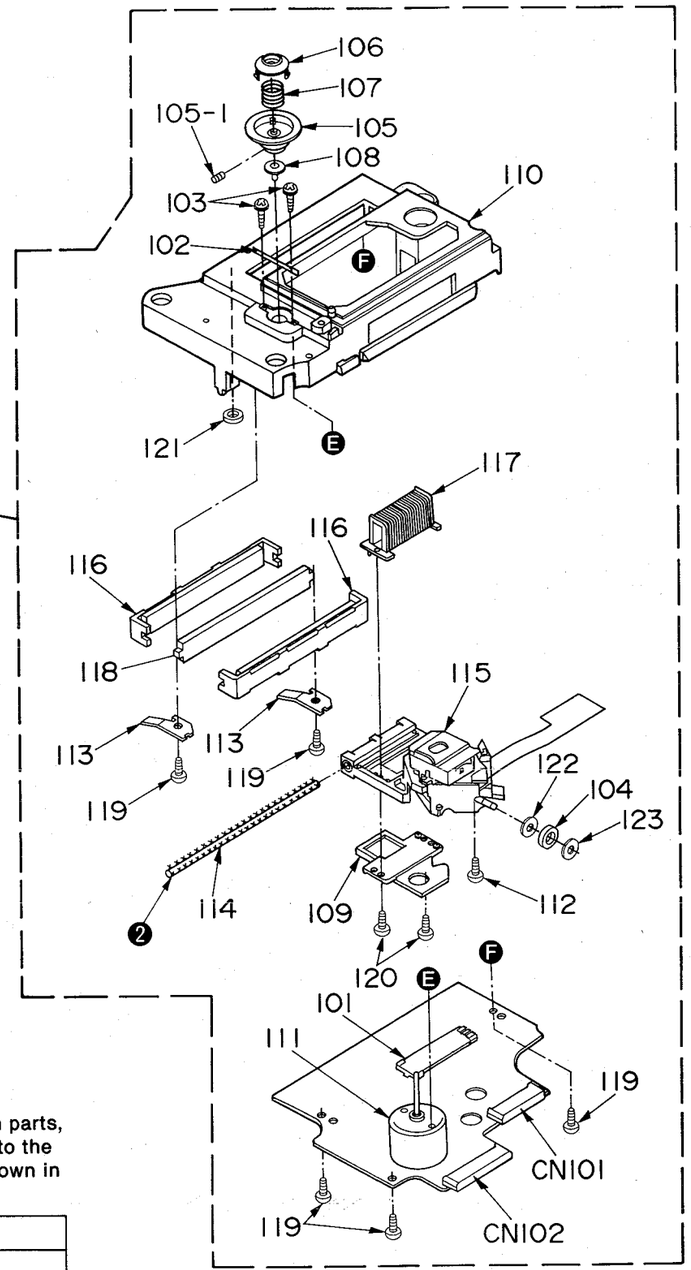
**Note:** When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

| Ref. No. | Part No. |
|---|---|
| ❶ | SZZ0L24 |



• **Loading mechanism parts location**




**Note:** When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

| Ref. No. | Part No. |
|---|---|
| ❶ | SZZ0L24 |
| ❷ | SZZ0L31 |

# ■ RESISTORS AND CAPACITORS

**Notes :** * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| | | |
| | | RESISTORS |
| | | |
| R11 | ERDS2TJ271 | 1/4W 270 |
| R13 | ERDS2TJ271 | 1/4W 270 |
| R15-18 | ERDS2TJ1R0 | 1/4W 1.0 |
| R21, 22 | ERDS2TJ102 | 1/4W 1K |
| R23, 24 | ERQ16NKWR15E | 1W 0.15 ⚠ |
| R26 | ERDS2TJ102 | 1/4W 1K |
| R31 | ERDS2TJ100 | 1/4W 10 |
| R32 | ERDS2TJ123 | 1/4W 12K |
| R33 | ERDS2TJ120T | 1/4W 12 |
| R101 | ERJ6GEYJ120V | 1/10W 12 |
| R102 | ERJ6GEYJ471V | 1/10W 470 |
| R103 | ERJ6GEYJ122V | 1/10W 1.2K |
| R104 | ERJ6GEYJ101V | 1/10W 100 |
| R105 | ERJ6GEYJ472V | 1/10W 4.7K |
| R106 | ERJ6GEYJ471V | 1/10W 470 |
| R110 | ERJ6GEYJ102V | 1/10W 1K |
| R111 | ERJ6GEYJ103V | 1/10W 10K |
| R112 | ERJ6GEYJ102V | 1/10W 1K |
| R113 | ERJ6GEYJ103V | 1/10W 10K |
| R114 | ERJ6GEYJ224V | 1/10W 220K Type A |
| R114 | ERJ6GEYJ104V | 1/10W 100K Type B |
| R115 | ERJ6GEYJ473V | 1/10W 47K |
| R116 | ERJ6GEYJ220 | 1/10W 22 |
| R117 | ERJ6GEYJ101V | 1/10W 100 |
| R118 | ERJ6GEYJ392V | 1/10W 3.9K |
| R119 | ERJ6GEYJ103V | 1/10W 10K |
| R120 | ERJ6GEYJ473V | 1/10W 47K |
| R121 | ERJ6GEYJ472V | 1/10W 4.7K |
| R122 | ERJ6GEYJ473V | 1/10W 47K |
| R123 | ERJ6GEYJ682V | 1/10W 6.8K |
| R125 | ERJ6GEYJ393V | 1/10W 39K |
| R126 | ERJ6GEYJ822V | 1/10W 8.2K |
| R127 | ERJ8GEYJ154V | 1/8W 150K |
| R128 | ERJ6GEYJ683V | 1/10W 68K |
| R129 | ERJ6GEYJ155V | 1/10W 1.5M |
| R130 | ERJ6GEYJ221V | 1/10W 220 |
| R131, 132 | ERJ6GEYJ682V | 1/10W 6.8K |
| R133 | ERJ6GEYJ101V | 1/10W 100 |
| R134-136 | ERJ6GEYJ331V | 1/10W 330 Type B |
| R401-408 | ERDS2TJ472 | 1/4W 4.7K |
| R412-414 | ERDS2TJ103 | 1/4W 10K |
| R415 | ERDS2TJ473 | 1/4W 47K |
| R451 | ERDS2TJ472 | 1/4W 4.7K |
| R452 | ERDS2TJ101 | 1/4W 100 |
| R455 | ERDS2TJ821 | 1/4W 820 |
| R461 | ERDS2TJ391 | 1/4W 390 |
| R476 | ERDS2TJ272T | 1/4W 2.7K |
| R477 | ERDS2TJ562 | 1/4W 5.6K |
| R478 | ERDS2TJ103 | 1/4W 10K |
| R479 | ERDS2TJ100 | 1/4W 10 |
| R501, 502 | ERDS2TJ473 | 1/4W 47K |
| R503 | ERDS2TJ271 | 1/4W 270 |
| R505 | ERDS2TJ203T | 1/4W 20K |
| R803, 804 | ERDS2TJ224T | 1/4W 220K |
| R805, 806 | ERDS2TJ822 | 1/4W 8.2K |
| R807, 808 | ERDS2TJ153 | 1/4W 15K |
| R809-812 | ERDS2TJ333 | 1/4W 33K |
| R813-816 | ERDS2TJ102 | 1/4W 1K |
| R817, 818 | ERDS2TJ473 | 1/4W 47K |
| R819, 820 | ERDS2TJ100 | 1/4W 10 |
| R851 | ERDS2TJ222 | 1/4W 2.2K |
| R852 | ERDS2TJ102 | 1/4W 1K |
| | | |
| | | CHIP JUMPERS |
| | | |
| R124 | ERJ6GEY0R00V | CHIP JUMPER |
| R134-136 | ERJ6GEY0R00V | CHIP JUMPER Type A |
| RJ101 | ERJ6GEY0R00V | CHIP JUMPER Type B |
| RJ102 | ERJ6GEY0R00V | CHIP JUMPER |
| TJ101, 102 | ERD25V0R00T | CHIP JUMPER |
| | | |
| | | CAPACITORS |
| | | |
| C11, 12 | ECBT1E103ZF | 25V 0.01U |
| C13 | ECEA1EU222B | 25V 2200U ⚠ |
| C15 | ECBT1H102KB5 | 50V 1000P |
| C17 | ECA1AM471B | 10V 470U |
| C19 | ECEA0JKA101B | 6.3V 100U |
| C21 | ECA1EM101B | 25V 100U ⚠ |
| C22 | ECA1EM221B | 25V 220U ⚠ |
| C23, 24 | ECBT1H102KB5 | 50V 1000P |
| C30 | ECFR1E104ZF5 | 25V 0.1U |
| C31, 32 | ECA1HM470B | 50V 47U |
| C33 | ECBT1H102KB5 | 50V 1000P |
| C101 | ECEA0JKA220 | 6.3V 22U |
| C102 | ECEA1HKS010 | 50V 1U |
| C103 | ECEA0JKS470 | 6.3V 47U |
| C104 | ECEA0JKS101I | 6.3V 100U |
| C105 | ECUV1E273KBN | 25V 0.027U Type B |
| C106 | ECUV1H101JCN | 50V 100P Type B |
| C107 | ECEA1HKS010 | 50V 1U |
| C108 | ECEA0JKS470 | 6.3V 47U |
| C109 | ECUV1C224KBM | 16V 0.22U |
| C111 | ECUV1H331KBN | 50V 330P |
| C112 | ECUV1E273KBN | 25V 0.027U Type B |
| C114 | ECUV1H471KBN | 50V 470P |
| C117 | ECUV1H122KBN | 50V 1200P |
| C119 | ECUV1H471KBN | 50V 470P |
| C120 | ECEA1CSN220I | 16V 22U |
| C121 | ECUV1C104ZFN | 16V 0.1U |
| C122 | ECEA1CKS470I | 16V 47U |
| C124 | ECUV1H561KBN | 50V 560P |
| C125 | ECUV1E103KBN | 25V 0.01U |
| C126 | ECUV1E822KBN | 25V 8200P |
| C127 | ECUV1C224KBM | 16V 0.22U |
| C131 | ECEA0JKS101I | 6.3V 100U |
| C132 | ECUV1C104ZFN | 16V 0.1U |
| C133, 134 | ECUV1H100DCN | 50V 10P |
| C135 | ECA0JKF101I | 6.3V 100U |
| C136 | ECUV1E104ZFM | 25V 0.1U |
| C137 | ECA0JKF101I | 6.3V 100U |
| C138 | ECUV1E104ZFM | 25V 0.1U |
| C139 | ECUV1E823KBN | 25V 0.082U |
| C140-142 | ECUV1C104ZFN | 16V 0.1U |
| C143, 144 | ECBT1H331KB5 | 50V 330P Type B |
| C301 | ECBT1C103NS5 | 16V 0.01U |
| C401 | ECBT1C103NS5 | 16V 0.01U |
| C402 | ECEA0JKA101B | 6.3V 100U |
| C403 | ECFR1E104ZF5 | 25V 0.1U |
| C451 | ECEA1HKN010B | 50V 1U |
| C465 | ECBT1C103NS5 | 16V 0.01U |
| C466 | ECEA1AKA470B | 10V 47U |
| C501 | ECBT1C103NS5 | 16V 0.01U |
| C502 | ECEA1AKA470E | 10V 47U |
| C551 | ECBT1C103NS5 | 16V 0.01U |
| C601 | ECFR1E104ZF5 | 25V 0.1U |
| C803, 804 | ECEA1CKA100B | 16V 10U |
| C805, 806 | ECCR1H391J5 | 50V 390P |
| C807, 808 | ECCR1H331J5 | 50V 330P |
| C809, 810 | ECEA0JKA220B | 6.3V 22U |
| C811, 812 | ECBT1H102KB5 | 50V 1000P |
| C815, 816 | ECEA1AKA470B | 10V 47U |



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